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THE AMERICAN ENGINEER

AUGUST, 1935

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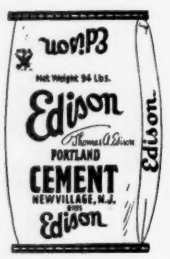

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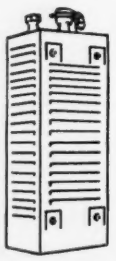

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CONTENTS

	Page
Officers Nat'l Society of Professional Engineers	4
Editorial Comments	5
A Scientific Money System	6
"Share the Wealth" and "Social Justice"	9
Engineers' Registration	11
Professional Engineering	14
Items of General Interest	16
State Activities Reported	17

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EDITORIAL COMMENTS

on

THE AMERICAN ENGINEER

Its Problems and Its Hopes

WITH this issue, the American Engineer presents a somewhat modified editorial set-up in the hope of invoking comment from its readers and its contributors. Upon the reaction will depend the expeditiousness of other contemplated changes.

The task of compiling and publishing a monthly magazine, under the conditions which attend the appearance of the American Engineer, can scarcely be appreciated by any but those identified with the preparation, publication and financing of its issues. One may safely venture the opinion that it would indeed be difficult to name another publication distributed regularly under such trying circumstances.

There is no paid personnel, there are no regular correspondents and there is no plentitude of available material with which to prepare the monthly issues; all for the unquestionably good reason that there are not sufficient finances with which to secure such ordinary (?) needs. Aside from the cost of printing and distributing, the expenditures of the magazine are practically nil. The business and editorial services are rendered at an actual financial outlay by persons whose means of livelihood exact from ten to twelve hours daily and who needs must forego many ordinary relaxations in order that the publication shall not fail.

That the National Society of Professional Engineers should issue a more impressive magazine is, and always has been, a conviction of the sponsors. That it will shortly be in a position to do so is the fond hope of those who are now striving to carry on. At the present writing there is justification for this hope.

In anticipation of a hoped for revision and expansion the editorial and business departments are laying plans for 1936. The consummation of these plans depends upon the membership of, and the cooperation from, the National Society and its affiliated state and chapter organizations. With an augmented and directed campaign for increased registration, for the expansion of the professional society movement, and for active participation by engineers in the civic affairs of the nation, state and community, the magazine can face the future with the assurance that time alone is the element which is required to build a publication worthy of the purposes to which it is dedicated.

In conclusion, the American Engineer invites comments and continues to offer its columns for the expression of news and opinions affecting the social, economic and professional welfare of the engineer and the well being of the American people. To its contributors it offers the only mark of appreciation at its command, viz., an expression of sincere gratitude. To its readers it appeals for indulgence. From its contemporaries, it seeks tolerance, from the profession support, from the public increased interest, and from its critics, the same consideration it extends.

A SCIENTIFIC MONEY SYSTEM

A TREATISE ON A SUBJECT WHICH IS MANKIND'S GREAT CONCERN

By
GUSTAV LINDENTHAL

THE present world-wide crisis is marked incisively by one universal characteristic, i. e., inadequate medium of exchange, which the so-called gold-standard system of money, as used in most countries, appears entirely incapable of solving. The whole world is searching for a substitute, but the ancient veneration for gold prevents it from seeing the archaic nature of the so-called gold-standard money system, which is a misnomer, because it consists prevailingly of (interest charging) private credit, functioning as a medium of exchange and only a small percentage of gold as a veneer. It is a very dear system even with this thin veneer.

We must consider, that within fifty years, the world's commerce—now estimated at over 3,000 billion dollars per year and requiring for its transaction a volume (of that kind of money) of over 300 billion dollars—will probably have more than doubled and that according to all known geological indications new gold will be only an inconsiderable addition to the present quantity in the world, valued at about 12,000 million dollars. Present experience shows that this is already too much of a gamble and entirely insufficient to maintain the complicated so-called gold-standard money systems as developed the last fifty years, and that they are in constant danger of collapse with growing world-trade and a thinner veneer of gold. So that a money system which practically requires no gold has become a necessity.

But the change will not be easy. The fight for an improvement may be long and bitter, because the belief that gold is the safest standard of value, around which all other values revolve, is an ancient and deeply ingrained superstition like the one in the past that our earth is the center of the world, around which the sun and the planets revolve. Who dared to doubt it? Was it not proved every day by our senses and confirmed by holy writ? It took over two hundred years after Copernicus for mankind to change that belief and see its error.

So with the workshop of gold as money standard, it is taught at all universities—the great majority of our professors of economics are saturated with it.

I believe, that our enlightened age will be able to overcome the inertia of prejudice more speedily and will recognize that gold is neither the center of wealth nor a reliable standard of value for it. But that on the contrary, *it is a commodity just as often unstable in value as other commodities,* besides being the least useful metal on earth. High civilization can live without gold, though none could live without iron.

We may grant, that the one quality which makes gold universally acceptable as an exchange commodity, is the native human desire for an indestructable substance of limited quantity, and therefore, high priced in a trade. It is entirely feasible to utilize this quality of gold for money in foreign exchange, but it need not and should not affect the stability of value of twenty and more times the quantity of money of different forms in domestic use, as shown further on.

The present panic has the mystifying and unprecedented aspect that millions of people are exposed to starvation in the midst of superabundance of food and other necessaries of life, because they lack the money to pay for them, and in their helplessness do not have a chance to earn it by useful work, of which there is no end, if properly organized.

Money is now accumulating in the banks from the forced and ruinous liquidation of useful and tangible property, which could not earn the usurious interest charges on debts that the present fictitious credit and gold money system had piled upon it for inflated values. That blood money, now accumulating in the banks is waiting for new investment, but which no one but the Government now dares to make, from fear he would be placing only a new rope around his neck, strangling him the minute the fixed interest for the loaned capital cannot be earned. Therefore, no one will take the risk to employ labor, and therefore we have 13,000,000 workers and their families starving as in a desert.

But the most dangerous side of the so-called gold money system, is that it produces fictitious paper capital, striving for a workless income on capitalized excess earnings and in the form of bank credit, charging usurious interest and dividends, ahead of wages and taxes. It is this tendency inherent in the false gold money system, coupled with a complicated hazardous banking system, which has put everybody (from the Nations down to the day laborer) into the chains of modern debt slavery. This fact stamps this kind of money and bank system as essentially dishonest, however much it may be praised by economists and bankers, who profit from it.

Here lurks the greatest danger to the State itself. Let a demagogue leader arise with the slogan: "*Down with the workless income, down with the greedy capitalist,*" and it would be hard to predict the final con-

sequences to life, order, and property, in a State with 30% of its population in soul-destroying misery and on the edge of starvation. It will not see the difference between capital in the form of savings from honest work and fictitious capital produced by the fraudulent leger demain of the stock speculator at the Exchange. In their desperate blind fury, the masses may destroy both and revert to some form of atavistic communism as in Russia. Such seems to be the cycle of progress and decay of civilizations, as recorded in known history.

As an Engineer I have thought about these matters for many years, observing the ups and downs of prices and wages, which influence cost of construction work between wide limits, and I have tried to analyze the causes and find a remedy for these recurring business depressions, which like the epidemics in the past seem inexplicable. But we laugh now at cholera or yellow fever, because we have learned to control and prevent them and other epidemics scientifically. So we can scientifically control and prevent business epidemics, when the true cause for them is found and the remedy prescribed. Its devastating violence was not foreseen by the shrewdest bankers.

Over ten years ago I had come to certain conclusions regarding money, which I had printed ready for publication, but if published then would no doubt have been denounced as heretical. So they may still be denounced, although they are confirmed by the developments since that time. This thesis is a revised and condensed form of my essay in 1922-23.

I believe that the catastrophe not only in this country, but in all countries suffering from the money crisis, can be ameliorated by rational legislation regarding money and banking, irrespective of treaties, reparations and tariffs, whose sinister consequences cannot be denied, but which would correct themselves the faster if there were plenty of good money. By which I mean money of stable purchasing power, as far as this is humanly possible, and it is certainly possible as shown hereinafter.

In a scientific sense, money can be conceived as consisting of a certain part or proportion of national wealth, converted into liquid form for the purpose of lubricating trade as a medium of exchange and as working capital. For prosperity there must be an abundance and cheapness of both. There is now a relative severe scarcity and dearness of both. How large this proportion should be is shown further on.

It is a fact no longer questioned by thinking men, that money in civilized countries with stable Governments and modern banks need have no intrinsic or commodity value. Paper money (credit currency) will answer the purpose of money in every respect, provided that it complies with certain conditions, which are here defined and will be discussed further on.

Fundamental Conditions for a Scientific Money System:

1. The creation of money shall be an exclusive governmental function. Its paper money shall consist of credit currency notes or/and certificates without interest, issued against the credit and wealth of the entire nation, and only for value received.

2. The total amount of currency notes or/and certificates issued shall be limited and maintained in a stable proportion to national wealth, or more conveniently, in the form of a certain fixed amount per capita of population.

3. The currency notes or/and certificates must be a legal tender for all taxes and all public and private debts, to the exclusion of all other kinds of money, whether paper, gold, or silver.

4. The income from taxes and other sources of the Government issuing the currency notes must not be less than the outgo of Government expenses. In other words—there must be maintained inviolate a balanced budget.

5. The credit currency notes or/and certificates shall be redeemable only in one way, that is, by the Government receiving them for taxes and dues and destroying them if need be.

6. The currency notes or/and certificates shall not be hoardable, and to that end a few simple rules can readily be enforced by the Government.

These six conditions are dictated by practical wisdom and honesty, as the fundamental virtues in fiscal matters.

Compliance with the six conditions will give money as near stable purchasing power as is humanly attainable without constant manipulation.

All the several paper money systems ever tried on a larger scale lacked one or the other or all of the six conditions, and therefore, must result in failure and economic disaster.

Gold and silver money has been used for thousands of years and is too deeply rooted in tradition to be wholly eliminated from that use. It is perfectly feasible for gold and silver to have their place in a rational money system, as hereinafter explained.

If in the following discussion the argument does not always adhere to orthodox economic and financial doctrines, it is because of the conviction among students of economics that some of the doctrines, like some theological doctrines, have been built up more on faith and superstition than on fact and reason, and so are becoming obsolete. Reference to historical, statistical, and other related matter examined in connection with the subject is omitted for the sake of brevity and as not essential for outlining the system in this brief treatise.

FIRST CONDITION

"Paper money shall consist of credit currency notes without interest, issued only by the Government against the credit and wealth of the entire nation, and only for value received."

A stable standard of value for the exchange of commodities has been the desideratum of every money system (metal or paper) ever used or proposed. But it has never been attained, because in the nature of things it is not permanently attainable. Value is an abstract quality adhering solely to things used by mankind.

Anything that can be exchanged, bought, or sold, has value and through this quality becomes a commodity which is subject to the law of supply and demand in all its ramifications. This indefinable purely psychical law, which cannot be expressed by any formula, is as universal and all-pervading for commodities as is the mathematical law of gravitation for celestial bodies. All values are relative and continuously react upon each other as do the celestial bodies. *No one commodity can have or maintain a stable value independent of other values, not even labor, without which no value can be created.*

Those economists who believe that gold, labor, farm products, or any other commodity, can be made to function in some way as a stable and permanent standard

of values by which all other values may be measured are as deluded as is the half-educated mechanic who endeavors to build a perpetual motion machine.

Since, however, we must have some measure for the exchange of values, we may readily obtain it in a similar way as the metric unit of measure and weights was obtained. Instead of singling out gold, silver, labor, wheat, or other commodities with which to measure and redeem the paper dollar, let us take the entire wealth of the nation as a guarantee for the value of the dollar. (The word "dollar" is used for convenience. It can be any other money unit, like: pound, franc, mark, etc. In the end, perhaps in a hundred years, only one money unit—the dollar—may prevail.)

There can be no stronger or more stable guarantee of value for such money than that of the aggregate wealth of the entire nation, subject to unlimited taxation. It comprises not only all its gold and silver, all its land, mines and concrete possessions and natural resources, but also the three active elements for the creation of wealth, which are capital, labor, and management. Their combination controlled by Government is necessary as in a three-legged tower, to hold up the entire structure of wealth. Without them wealth can neither be created nor maintained. The failure of one means the collapse of the whole.

Just as the meter has been scientifically derived as a definite fraction (the ten millionth part) of the meridian earth quadrant, so can the value of the dollar be similarly defined as a certain fraction of national wealth. The wealth of a nation cannot, of course, be defined with the accuracy of the earth quadrant. Its elements have not anywhere the same stability of definiteness. There is permanent, half-permanent, and perishable wealth. There are luxuries and in different countries and climates differing proportions of even the prime elements of wealth necessary for human existence (food, clothing, shelter, and fuel) and there is active and latent wealth. But the total of national wealth is less fluctuating than the value of any single commodity, and therefore, the value of the dollar, backed by the entire wealth, will be less fluctuating than the dollar backed by some single commodity like gold, silver, labor, etc. *It is not necessary that the national wealth be defined with any meticulous accuracy. It is all-sufficient for the purpose that the dollar be based upon population, according to its rank in industry and resources.* And so it will happen, that the comparatively stable value of the dollar of one country may differ from the similarly stable dollar of another country; their relation one to the other in international trade will inevitably and properly establish itself continuously in the markets of the world without the need of any regulation or law, provided only that hoarding of money is made impossible.

Gold as International Yard Stick

There is no good reason why the relation of the scientific dollar (call it for short the neo-dollar) to other moneys, whether gold, silver, or paper, should not be indicated by reference to gold, as is the established practice already with all money now, always keeping in mind, that gold like any other commodity, can have no permanent stable value and that a universal stable money unit is as impossible as universal stable weather.

But for greater convenience *the ounce or other weight unit of gold* of a defined fineness, rather than coined gold, should be agreed upon, not as a money unit but as the international yard stick or denominator for comparing money values. Thus the ounce of gold would be quoted at its market value from day to day in dollars or francs or marks or pounds, etc., whether of gold, silver, or paper. All calculations would be simplified. The United States Treasury and other purchasers would buy gold at market value and pay for the metal with neo-dollars, pounds, francs, marks, etc. Warehouse certificates based on ounces of gold would serve in the settlement of international balances. The certificates should be loaned not sold. The interest thereon plus a bank tax would have the effect of speedily returning them to the Treasury where they originated after having served their purpose.

The tax would induce settlement of international balances in export and import trading, whenever possible with other commodities than gold. It could be done also with silver at its market value, thus a smaller quantity of gold would suffice for international trade, which after all is for most countries only a fraction of the domestic trade. This would not and should not be affected by foreign trade. The tail should not be allowed to wag the dog. The vast volume—over 90 per cent in this country—of internal commercial transactions would thus be carried on independent and unconscious of gold. The risks of variation in money values from one country to another would be confined to comparatively small balances in foreign trade. All money systems would in this way be virtually on the gold basis for foreign trade as they are now, but no one system could claim distinction or prestige over another system; *no one system would rule the world trade in money matters.* They would adjust themselves automatically.

SECOND CONDITION

"The total amount of currency notes issued shall be limited to and maintained in a stable proportion to national wealth, or more conveniently to population."

The bigger the country and the nation, the less variable is its total wealth and the greater is the safety and stability of its dollar or other money unit. The consolidation of small nations into larger economic units must be the aim of progressive statesmanship.

In times of peace, the national wealth of civilized nations is steadily increased as a result of inventions and progress in science and art. In times of war, the normal increase of wealth is checked and in a long exhausting war much wealth destroyed. But it can readily be restored, and always was restored, provided the wealth-producing power of capital and labor is not interfered with by unwise legislation or by the creation of malign economical and political conditions, as now is the case after the last war. They are after all exceptional and transitory and will not be tolerated long, when the vicious and injurious consequences affecting the entire world trade are finally recognized.

Long periods of unemployment and curtailing of wealth-production cannot normally occur with plenty of good money in circulation, as will be shown further on. We know that the wealth of every civilized nation has on the whole increased more rapidly in the last hundred years than ever before, although periodically checked by war. It can and will further increase with a money system which will make, as hereinafter shown, working capital cheap and long periods of non-employment impossible.

(*Continued on page* 24)

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"SHARE THE WEALTH" AND "SOCIAL JUSTICE"

Some Reflections and Comments Upon New Movements

By
LEOPOLD LEITNER

ALTHOUGH the "Share the Wealth" and "Social Justice" movements are momentarily connected with the names of two prominent Americans, some of the economic tenets involved have been proposed by others on numerous occasions during recent years. There is, for example, the 30-hour week, which, accurately speaking, does not belong to either of these movements, since their proponents could not, of course, restrict themselves to such a rigid proposition. The sponsors of the movements want work for everybody, regardless of the length of the working week. It may be 30 hours, it may be more, or, it may be less. The "Share the Wealth" principle, in a modified and none too desirable form, seems also to be part of the policy of our present government.

Whatever the merits of these movements may be, they could scarcely have less value than the criticisms. According to the critics, a minister of the gospel apparently should talk about the gospel, or keep his peace. He should be practically denied the right of citizenship. These critics, to all appearances ignorant of the principles involved in the epochal changes of our civilization, talk about the advance guard of fascism to audiences no more versed in a modern society than themselves. Having nothing to propose, they content themselves with dispensing epithets.

In this economic pandemonium it is only reasonable that the engineer should have a word to say. He is one of the chief producers of wealth; he should know whether this wealth-production requires a 30-hour working week, or more or less; he should be able to tell how this wealth can be equitably distributed.

We all appreciate that wealth is somehow tied up with money. To elaborate and to use, for want of a better expression, a mathematical terminology, money is an unknown function of wealth. It has been said that the Governor of the Bank of England once confessed that he did not understand the workings of money. These two statements are much the same. They are negative statements which seem to lead nowhere. They teach, however, one lesson: do not make large-scale economic calculations on the basis of money, because they are likely to prove fallacious. For example, Henry Ford decided to raise the minimum daily pay from say $2.40 to $5.00, an increase of over 100%. Orthodox economists probably believed that he lost his wits; but this drastic step helped greatly to raise the general standard of living and to increase the market for cars.

Lately a proposal has been made that everybody could own a home worth, say, $5,000. No sooner was this set forth than our arithmetically minded economists added up the "wealth" of the country, divided it by the population, and, believe it or not, found that there are only a few dollars per person. The discovery is suddenly made that the prosperity and wealth of the nation is an illusion, that the country is in reality a large poor-house. It is indicated in black on white.

However, there is no doubt that if a way could be found to use our 10 to 15 million unemployed in building homes, there would soon be a house valued at $5,000, for everybody who needs one. The proposition that everyone should have a $5,000 home does not seem absurd if the tag "$5,000" is left off and only the words "house" and "work" are concentrated upon. Every engineer knows, and every economist should know, that besides the raw material furnished by nature it takes labor to build a house. The material is present, and, to use a term from science, so is the potential energy.

This does not mean that masses of people should make a grand rush at, say, Ford's plants to get a proper share of the national wealth. Under such a condition, some might get a part of a lathe, others a chunk of a drop forge. These relics would not help the individual. Plants such as Ford's must be managed as a whole or not at all and, it might be properly said, that his plants are well managed for the benefit of the country as a whole.

Those who stress the fact that 90% of the country's wealth is owned by 5% of the population (or whatever the figures may be) are just as wrong as are the arithmetically minded economists. The important thing is, —what percentage of the national income flows into the pockets of what percentage of the population.

When the nation makes it a policy to arbitrarily break up large fortunes through enormous taxation it courts confusion. Such a policy suggests a punitive expedition using taxes as a means of punishment. Taxes should not be considered as punishments. They are intended as the monetary means of making government possible. Of course, those who can afford it best, should carry most of the burden. However, to deliberately destroy large establishments would have a worse economic effect than would confiscation. In the latter case, there would at least be a superorganization, whereas the breaking-up process merely destroys an existing organization. In the end there will always have to be somebody to manage, and the man who has any idea of, say, Ford's economic principles, would rather see Ford himself, than an unknown politician, manage his business.

The economic problem society faces is the distribution of incomes. Profit must be controlled in order to leave a proper share for wages. Interest rates must be controlled lest the paper wealth run away from its ac-

tual foundation. A reasonable equilibrium can be found between interest rate and profit on the one hand, and wages on the other, to insure a balanced development of the entire economic system. Assuming that the growth of actual wealth will eventually be limited by nature, interest on capital, as well as profit, will have to gradually decrease. For such an economic control, the most obvious means to date suggested is government banking.

A great many charges have been made concerning private banking. Some accusations are obviously justified, others, such as complaints against bankers lending many times their actual assets, are not quite so justifiable. In what other way should bankers lend money in order that they may pay interest and meet overhead expenses? One point, however, which has not been brought out and for which, in the absence of government banking, nobody is to blame, is the unequal economic development of the country. Private financing acts, more or less, on the spur of the hour, and seeks, of course, the most profitable investment. All too often the most profitable investments seem to have been outside the borders of the country; hence the extensive foreign loans. We might as well be honest about foreign loans; capital sought the highest interest; there is nothing philanthropic about a financial transaction. A point of concern, however, is the fact that sections of this country which momentarily cannot attract private capital for lack of sufficient return are completely forgotten so far as economic development is concerned. State financing of sufficient scope is made difficult on account of high interest rates. A government bank could, however, supply backward areas with sufficient capital to help their development. As was pointed out in a previous article by this writer, the financing of public works should be on the basis of *no interest*. A highway or a bridge which has to be constructed immediately but financed over an extended number of years may cost 150% to 200% of the actual construction outlay to those of the present generation whose benefit is immediate,—the extra 50% to 100% serving mainly to increase paper wealth. There is no doubt but that a great deal of public construction would be undertaken if it was not for the extra charge occasioned by interest.

The writer is well aware that the above proposed drastic financial step would carry with it a host of other changes. However, without going into details which are beyond the scope of this article, it is suggested that the said changes would bring the paper wealth more into harmony with what it represents and in so doing insure a steady economic expansion.

Government banking would prevent capital, the result of the sweat of the brow of the American workers, from flowing into foreign investments; investments which not only will not benefit the average American but which may be distinctly harmful and give the possessors of these investments only the distinction of owning something somewhere else. In the case of a normal economic development, and that is what we are striving for, this capital cannot come back. Government banking would help distribute wealth in America by keeping it there.

Lest we appear to be dreaming of an economic Utopia, some points which are not so favorable should be mentioned. There is the well-founded American dislike for any kind of a centralized system, and this applies to banking, government or otherwise. The local banker is a typical American institution. This institution may not function so well during critical times, but ordinarily the local banker knows the community needs and has the confidence of the people. What assurance is there that, with a government banking system, the value of the local banker will not be lost? What is more,—what assurance is there that with government banking the loans will flow into the right channels? The old Roman cry, *panem et circenses*, is not unknown to American politicians. The first objection could perhaps be answered by adopting a system which would maintain the local banker, such as has been proposed by the sponsor of the Social Justice movement. The second objection is more difficult to answer. Leaders in politics are not necessarily good economists and usually are not permeated with the spirit of the Greek philosopher who once tread on the vanity of his fellow-philosopher. To use a concrete illustration, New York City has the unenviable reputation of having its shores washed by perhaps the filthiest waters in the world. The Metropolitan Sewerage Commission, supported by sanitary engineers from both shores of the Atlantic, recognized, before the World War started, that something should be done about it. Almost a generation has passed and the waters have become filthier, supposedly because of the lack of public moneys. There seems to be enough, however, for the building of a palatial zoological garden in the same City, the opening of which was accompanied by florid speeches, and the applause of the plebis.

Government banking, like other public institutions, is a mixed blessing. It curtails the liberty of a few least the few curtail the liberty of the many. Theoretically speaking, there is no doubt that government banking is more economical than private banking. It is up to the people to choose the right officials to conduct the banks.

Taking proper financing for granted, it does not appear a Herculean task to put all the unemployed back to work. Using discretion as to localities and industries, we could, in a modified way, add up the required working hours and divide these by the number of workers in order to arrive at an approximate working week. In an article of the March Scientific Monthly, by Dr. H. G. Moulton and Dr. M. Leven of the Brookings Institution, the authors find, as the result of a professed scientific investigation, that a 30-hour working week would be insufficient. There is no quarrel with this reasoning, except that the authors implicitly assume that the United States will continue to carry on an active export trade. This is hardly possible. However, such a fact should make little difference.

Discussions on working hours at times assume an almost humorous aspect. Twenty-four can be divided by six and by eight. A six-hour shift may be too short, and an eight-hour shift too long. An eight-hour shift would have to be used for expediency, so some argue, tacitly, taking it for granted that some people will have to be out of work. Is our civilization really so inflexible? Did God divide the year into 52 weeks and a day, the week into seven days, and the day into twenty-four hours? Without delving into archeology for the history of the twenty-four hour day, it is safe to assume that in past times the day was divided up into certain periods for very practical reasons. Running the risk of appearing facetious, this writer would

(*Continued on page* 23)

ENGINEERS' REGISTRATION

Related Problems of the Profession

By
DAVID B. STEINMAN

Address delivered at Summer Convention of the American Institute of Electrical Engineers

ENGINEERS are pioneers, pathfinders, trail blazers in almost everything they do,—with one exception. They have left it to the other professions to be the pioneers and trail blazers in the field of securing professional recognition,—in the field of organizational and legislative activities for the advancement of the status of a profession. The medical profession started over eighty years ago, the legal profession over fifty years ago, but the engineering profession is just commencing to direct its planned activity to the problems of professional standing and recognition.

We are fortunate that others have blazed the trail and that other professions have solved for us many of the problems involved. If there is any wisdom in the collective mind of the engineers of the country, we will lose no time in profiting by the successful examples of the professions that have solved these problems before us; and the first essential step in such program is the enactment of laws establishing qualification standards for the practice of the profession.

Progress of Registration

Engineers' registration laws are now in force in 33 states. In these 33 states are located over 85 per cent. of the engineers of this countrry. In addition to these states, the three possessions of the United States—Hawaii, Puerto Rico, and the Philippines—also have engineers' registration laws. The progress of enactment of engineers' registration laws dates from Wyoming in 1907 and New York in 1920 to Ohio in 1933 and New Mexico, Washington, Utah, Maine, Oklahoma and Connecticut in 1935. More states are being progressively added to the list. Such legislation is now pending in 10 additional states, leaving only 5 states (of small engineering population) in which the profession has not yet decided to advance the registration movement. With the active impetus given to the movement by the National Society of Professional Engineers, more rapid progress may now be expected in extending registration to cover the remaining states.

Over 45,000 engineers have already been registered in 33 states—over 12,000 in New York State, over 6,000 in California, and over 4,000 in Pennsylvania. Engineers' registration is now an established fact, and it is here to stay.

The Philosophy of Registration

The underlying philosophy of registration laws has been aptly expressed by Arthur V. Sheridan, Past President of the New York State Society of Professional Engineers:

"Regulation of human activities is a *sine qua non* of civilization. Without it chaos would be the concomitant of communal existence. There are, of course, limitations, for even regulation does not justify servitude. Throughout the ages philosophers have debated the ability of mankind to adequately direct itself. Regardless, however, of academic disputations the fact remains that society cannot avoid the responsibilities arising from the gregarious instincts of human beings.

Modern civilization, the creation of the engineer, has found it necessary to regulate the practices of persons whose activities deal with the protection of human life, human health, human rights and human property.

Three professions, Law, Medicine and Engineering, are primarily entrusted with the responsibility incidental to such activities. The elimination and exclusion, as matters of public welfare, of the dishonest and unqualified from the practice of these professions are undebatable tenets. It is to the accomplishment of such aims that truly professional associations are dedicated."

The Public Aspect of Registration

Engineers' registration is required for the protection of the public. The work of no other profession more truly concerns the safety of life, health and property. There is a public demand for this legislation, and we owe it to the public and to our profession to take the initiative. We do not want the legislation to be thrust upon us. Being fully conversant with the problems involved, we want to have a hand in writing the law, in securing its enactment, and in directing its administration,—as a recognition of our responsibility, as a profession, to the public.

The public needs to be protected against the quack, the incompetent, the unscrupulous, and the imposter, who do not belong in our profession but nevertheless practice in its name. The investor needs to be protected against "engineering" reports by the unqualified and the unscrupulous. The client needs to be protected against paying fees to quacks and incompetents who hold themselves out as "engineers." The courts need to be protected against the testimony of "experts" who pose as members of our profession. The public needs to be protected against improper planning, inefficient design, wasteful execution, and excessive cost, also against dishonorable dealings. Mere structural adequacy is not the only desideratum.

Protection of the public is the legislative justification and establishes constitutionality. This benefit has been established. Protection of the profession, its standing and its standards, is a concomitant benefit. The two benefits are inseparable. The elimination of the unqualified and the unworthy benefits both the public and the profession.

Professional Aspects of Registration

Engineers' registration laws derive their primary justification from considerations of public safety and the protection of public interest; but they are also

necessary for the protection of the good name of the profession and its standing in public confidence.

A profession is judged by the qualifications of all who use its name, by the failures of the incompetents and by the conduct of the unworthy, unless a clear dividing line is established in public recognition between the lawful practitioners of the profession and those who are not admitted to practice.

A profession should be empowered to disown those who hold themselves out as belonging to it without proper qualifications or character and to bar the unfit and the unprincipled who seek to practice in its name. The public expects a trusted profession to maintain high standards of qualification and to clear its ranks of those who do not meet those standards and whose pretensions and activities would degrade its good name.

Without registration laws, there is no way: 1) to stop the practice of engineering by the non-engineer; 2) to stop the misappropriation and abuse of the designation "engineer"; 3) to oust from the profession those who prove incompetent and unworthy; and 4) to preserve to the qualified engineer his rights of practice against restriction, encroachment, and unqualified competition.

Registration places the force and sanction of the law behind the desire of the profession to maintain a clearly recognizable line of demarcation between the engineer and the non-engineer. It places the agencies of the law behind the efforts and aspirations of the profession to maintain high standards of qualifications and ethical practice.

Registration and Public Recognition

Registration places engineering on a par with law and medicine as legally restricted and recognized learned professions. With the aid of the registration laws that have come into being in our statute books, the engineering profession has made more real progress in the past ten years in the solution of many of its problems and in securing public recognition than in all the decades preceding.

The other learned professions, such as law and medicine, have long had laws in all the states regulating professional admission and practice. Public respect and confidence toward those professions have grown in proportion to the virility with which they have used their registration laws to maintain high standards and to eliminate the untrained and the unethical. Engineers' registration will accomplish the same objectives for our profession. It is an essential step in our program of securing for the engineering profession its rightful place in public confidence and respect.

We cannot expect the public to distinguish between the engineer and the artisan or mechanic, between the professional man and the imposter, and between the professionally trained and the half-trained or immature, unless we adopt the accepted and established procedure for legally qualifying and identifying the members of our profession. The public will not have proper regard for our profession unless we, ourselves, hold it in sufficient regard to exclude those whose practice or pretentions would degrade it. We cannot do these things without registration.

Protection of the Designation

A problem closely related to registration is that of protecting our professional designation.

The individual engineer has invested many years of his life in professional education and arduous professional training in order to qualify as an "Engineer." The profession is investing decades of united effort to win public recognition and esteem for those who bear the title "Engineer." All of this investment is largely nullified if the use of the term "Engineer" is left unprotected.

The dignity and respect that rightly belong to the designation of a learned profession cannot be maintained when that designation is abused by misappropriation.

The public judges a profession by the examples it meets. When the public sees men who are unlettered and untrained holding themselves out as "engineers," respect for the engineering profession is weakened or destroyed. When the public sees the word "Engineer" on the shop window of a plumber, an electrician, a radio dealer, or an automobile mechanic, a wrong picture of the engineering profession is implanted.

For years, the engineering profession talked about this problem—the abuse and misuse of the term "engineer"—but nothing was done about it. Finally, with the aid of the registration laws, means for successfully protecting our designation became available.

At first, public officials were slow to cooperate. They declared that we could not "copyright the dictionary." We pointed to the precedents of the other legally established professions which had successfully "copyrighted large chunks of the dictionary." Any unlicensed man hanging out his shingle as a "Lawyer," a "Physician," a "Dentist," or an "Architect" will be promptly arrested and subjected to the penalties of the law. These respective professions will see to it, and the agencies of the law will back them. (Recently, in New York, the legal profession had an insurance agent arrested because he allowed a customer to call him "counselor" without correcting her.)

Clauses protecting the designation "engineer" have now been written into most of the state registration laws, and have been made enforceable. In New York State it is now unlawful for any unlicensed person "to use the title engineer or any other title, sign, card or device in such manner as to tend to convey the impression that such person is a professional engineer." The Tennessee law forbids unregistered persons to "use the appellation Architect or Engineer, or any appellation which is a compounding, modifying or qualifying by an adjective of the words architect or engineer, or both."

These and similar provisions of the registration laws in the various states have been tried and tested for scope of effectiveness. In the past few years, hundreds of violations have been successfully corrected, largely through voluntary cooperation.

Enforcement of Registration Laws

When the engineers' registration movement was young, many disregarded it or were ignorant of it because enforcement and publicity were lacking. Teeth have now been put into these registration laws, and enforcement procedure is being progressively strengthened. The machinery of enforcement has been put into effect, and men have been arrested, tried, and fined for practicing engineering without a license.

In one court, a man was convicted of manslaughter for the collapse of a structure which he had designed without a license to practice engineering. In another case, an unlicensed man was sentenced to the workhouse for using the designation "Civil Engineer" on his letterhead.

In two years in California, 23 violations of the engi-

neers' registration law were prosecuted in the local courts, resulting in 21 convictions for unlicensed practice. The maximum penalty assessed was a fine of $100 or 50 days in the county jail.

In one year, 105 unlawful listings as "Engineers" were eliminated from the New York Telephone Directory, and 217 other violations were handled by the New York State enforcement authorities and corrected without resort to the courts.

The civil courts have established a significant precedent in repeatedly dismissing actions for the collection of engineering fees when such actions were brought by men who were not registered as engineers. The courts have ruled that a contract for engineering services is invalid if the party undertaking to furnish such services is not registered.

The courts have repeatedly disqualified men offering engineering testimony when such "experts" were found to be unregistered.

The Supreme Court of Tennessee ordered a concern to abandon its trade name "The Standard Engineering Company," because the members of the firm were not registered engineers.

The courts have ruled that even college graduates with professional degrees may not use such designations as "Civil Engineer" or "Electrical Engineer" until they are admitted to professional registration.

In New York State, seven professional engineers nominated by the State Society of Professional Engineers have been sworn in as Deputy Investigators and added to the official enforcement staff to assist in investigating and correcting reported violations in the various parts of the state.

In Oregon, following approval by the Attorney General, funds from registration fees are used for a statewide campaign of newspaper advertisements informing and warning investors, employers, mine operators, engineers, industries, and utilities, concerning the requirements and purposes of the engineers' registration law.

Public officials are progressively taking a keener interest in the enforcement of engineers' registration laws. Construction plans signed by unlicensed men are rejected by Federal and local officials. Men not registered as engineers are debarred from holding office as county engineers or city engineers. Civil service commissions are cooperating by requiring a license as a prerequisite for appointment to engineering positions. In every way registration laws are becoming more real and more effective in their operation.

Registration Laws and Educational Qualifications

In recent years, another step of progress has been recorded in engineers' registration laws. We have brought the legislators and the public to recognize the fact that engineering is not an empirical calling, but a learned scientific profession. In recognition of that fact we have written into the laws educational requirements for the licensing of engineers. The laws now generally require qualifications of moral character, evidence of completion of academic and professional education, and in addition a number of years of practical experience in engineering work of a character satsifactory to the Board of Examiners. Both college graduates and non-graduates have to pass written examinations. The gates are not yet barred to the man who has not had the advantages of a college education, and he is given an opportunity to show by examination that he has the equivalent technical training. Where a minimum of four years of practical experience is required of graduates of approved colleges of engineering, a minimum of eight years (soon to be changed to twelve years,) is required of the non-graduate before he is admitted to the licensing examinations, and in his case the examinations are necessarily more comprehensive.

Through high standards for registration, we can impress upon the public the fact that engineering is a *learned* profession.

Registration and Professional Unity

Another important principle that has been recorded through the agency of our registration laws is that of the solidarity of our profession. We have recorded the principle that engineering is *one* profession, although specialties may be many. We do not license the specialist; we license the engineer. We do not place any limitation upon the branch or specialty in which he may engage; instead we expect the board of examiners to make sure, before granting a license, that the man can be trusted not to engage in any specialized work in which he may not be qualified.

The same principle has long been established in the medical profession. That profession has firmly and consistently resisted every suggestion of legal division or superqualification into specialties. Self-limitation of field of practice has been kept a matter of professional honor, and legal limitation has been rejected.

Others may wish to emphasize the diversification of engineering into specialties. It is for us to proclaim the fundamental unity of our profession. Whether a man writes E. E., C. E., M. E., E. M., or Chem. E. after his name, he has the same common basic educational training, the same governing professional qualifications, the same method of analytical approach to technical problems, the same ideals of professional practice, and the same interest in the profession's problems of public recognition, protective legislation, and relations with other professions.

Law and medicine have as many specialties as engineering, but lawyers and doctors would never approve of the legal subdivision of their professions.

Some of the states license men in specialties or branches of engineering. It is the prevailing opinion that such procedure is a mistake. Registration can and should be used to proclaim the essential one-ness of our profession.

Protection Against Restriction of Practice

Another effective application of our licensing laws has been in the protection of engineers against discrimination and restriction of fields of practice. Our profession has taken the position that we do not seek to interfere with the rights of practice of any other profession, but at the same time we have firmly recorded the principle that we will not allow any other profession to restrict the rights of practice of the engineer. We have had our battles on that issue and the victory has been won.

In different states, legislation sponsored by architects would have eliminated or subordinated the engineer in the structural field; physicians endeavored to monopolize the sanitary field; accountants sought to exclude others from the making of financial reports; lawyers sponsored legislation which would have deprived engineers of the right to prepare contract documents and to engage in arbitration proceedings; and

(*Continued on page* 22)

PROFESSIONAL ENGINEERING

Its Future and the Causes Thereof

Civilization Makes Result Inevitable

By
WILLIAM E. BULLOCK

ENGINEERING has sometimes been characterized facetiously as the art of making two blades of grass grow where but one grew before. The implication of such a thought is more or less obvious, but it is nevertheless basically unfortunate. For the thought implies that someone other than the engineer grew the first blade of grass, and all the engineer did was to come along and increase the efficiency of someone else's handiwork by a percentage.

Now we know that much of professional engineering has been devoted to the consummation of such increases in efficiency. The ability of the engineer to squeeze another heat unit out of a pound of coal or a gallon of oil is traditional. This ability has resulted in unique economies in the uses of both the materials of nature and of the energies of man himself—the latter so much so that society finds itself confronted with probably the most unsolvable problem of the present civilization, the organization of leisure.

And now back for a moment to the two-blades-of-grass idea. The real situation is that engineering is more often the art of making *one* blade of grass grow where none grew before, and it is also the art of determining the conditions under which a blade of grass will not grow at all! In other words, in this era of universal belief that nature and natural materials exist only for the use of mankind, while seemingly unlimited sums of money begging to earn interest in new and novel speculations in inventions, are available, the work of the professional engineer is highly valuable in recommending grass is not desirable in every place.

The Present-Day Professional Engineer

A characteristic of the development of the engineering profession in the United States, has been the progressive increase in self-reliance of the professional engineer. The propaganda of the engineering societies notwithstanding, the professional engineer in this country is very much of a confident individual. In these days of so much unemployment, he does not at present usually have very much money, but he has an underlying strength of will which would be the envy of many a lawyer, many a doctor, many a banker.

Not many professional engineers have committed suicide as a way out of depression-mania. Many lawyers, doctors and bankers have. Propaganda engineering societies—there are such things—would say that this is an evidence of the time-honored sense of inferiority which they have claimed the engineer suffers interminably. Yes, for years within the memory of all of us, the engineering societies have invariably pictured the engineer as a man who was passed by when it came to salary increases and assignment to the best jobs available in the business corporations, simply because he had not received full recognition from the public!

In this era, some leaders in professional engineering —fortunately only a few—found stepping stones to high office in the organizations by capitalizing this alleged inferiority of the individual engineer. They would not have done so had not the societies succumbed to the so-called democratic principle in their election of officers, and thus made it easy for the charlatans to be escorted to the rostrums of the societies, and in return for the honors conferred upon them, orate large groups of otherwise manly citizens into believing that their profession had been incurably hexed by the whole community outside of engineering.

Some thinking engineers of the present-day, sense that certain engineering societies have waned considerably. Others just as reflective are sure that the societies are as "strong" as formerly, and that it is the influence and opportunity of the engineer himself that have waned. You can take your choice as to which of these groups of thinkers you feel with. However, it is quite certain that the mental capacity of a professional engineer has by whatever evolution become a fairly standardized thing. Not that there are not good and bad engineers, but rather that the quality of a professional engineer is not determined by the quality of a professional engineering society, nor by the quality of the community at large.

In plain words, an engineering mind is an entity. This must have been so for a very long time, in fact long before there were any engineering societies or any license laws. If you are an engineer, you know what the inherent qualities of the engineering mind are. You know, for example, that this mind is fundamentally honest. It is uncompromising on principle; the principle may be wrong scientifically, but it is never wrong morally. This mind is very rational, and in fact next to fundamental honesty, rationality is probably dominating. Yet, of course, there are engineers who are inventors, and hence can generate irrational ideas. But after generation, the development of the idea is carried out along lines of extreme and austere rationality.

Reiterating,—the present-day professional engineer is as complete a personality and as fully possessed of the faculty of responsibility as any member of any orientated group in the community. Moreover, the professional engineer is the *least* orientated and the least obsessed, as it were, of any of the professional types. In the parlance of the day, a professional engineer "gets to know what it is all about." He may not be able to do anything about "it," but that makes no difference. He can always sit still and think and await the king's pleasure; and anyone who knows how

to await the king's pleasure can qualify for the kingship himself.

Some Explanations of Organization Phenomena

Though it has been implied that the professional engineer is to an unsuspected degree independent of his organizations, nevertheless to the extent to which his material welfare is bound up with that of his employer, and to the extent to which the employers of engineers essay as it were to maintain a "buyer's market" for engineers' services through influencing the societies, the professional engineer needs must understand and interpret organization movements.

In the light of this observation, the objectives of the forces behind the 'Engineers' Council for Professional Development" which were discussed in the July issue of *The American Engineer,* stand revealed in a new way. As this author has contended elsewhere, these objectives are purposeful in limiting the supply of men who "offer their services in the engineers' market." In this light, the work of the E. C. P. D. is largely self-contradictory. Business corporations, requiring an ever increasing number of engineers, and only able to control the cost of engineering services when the supply of engineers is greater than their requirements, are hardly doing the sensible thing by jacking up the standards of admission to their favored societies.

On the other hand, it is unquestioned that an engineer ought really to be an engineer.

However, a further inconsistency in the operations of the E. C. P. D. arises from the fact that all the so-called professional engineering societies which compose it have become what can be adeptly described as "engineering data organizations." They constantly receive and publish engineering data given them by business corporations. The fact that these data are presented in the form of technical paper published in Transactions under the author's names for the purpose of "giving them standing in the profession" does not make the data any less commercial. While everyone surmises this of course no one says so. Everyone does know however that there are very few data today that are not commercialized or on the way to be so as soon as they are published.

The standing that a member gets from presenting a technical paper is simply a vestige of an honorable custom. It is interesting to note that in at least one case in this country, the said honorable custom was patently initiated by a commercial agency. This reference is not meant to be derogatory in any way. It merely states a circumstance which at the time undoubtedly helped to start some engineers on the road to what they have since become. Further, many organizations have since been started in the same way and one might properly say are being started in the same manner every day. Of late, however, we are accustomed to "sponsored programs" on the radio—and we don't think less of Amos 'n' Andy because of Pepsodent, nor probably less of Pepsodent because of Amos 'n' Andy.

Regardless, we are still left with the stimulation that the professional engineer is today a basic individual. Whether he would have more work if the E. C. P. D. were not taking up program time at the conventions of his societies, or if the remaining States were to enact license laws,—these may or may not be pertinent conditions.

However, there must be basic reasons why the last few years have witnessed so great an acceleration in the licensure movement. One of these may be that public authorities independent of the desire of the engineer and his organizations, have themselves decided that a professional engineer is entitled to the same protection of his practice as that enjoyed by other professionals. Another may be that the public is now more concerned over the safety of engineering works. Still another is that the engineering data societies have undoubtedly lost their appeal to those engineers who traditionally expect their organizations to be always doing something to promote their welfare; these societies have not had the financial resources, nor, in some cases, the intelligence.

Whatever the reasons may be—the fact remains that the licensure movement has manifested a great development—as is evidenced by the existence of this very journal and of the National Society of Professional Engineers which is sponsoring it. The journal has been criticized perhaps, but it should not be; though new, it is functioning. It offers its columns to the professional engineer who has something to contribute and invites him to utilize its services. It has a future.

The Future of Professional Engineering

Let us return to the main heading which this article bears, prepared to offer a few speculations. What is the future of professional engineering? We all have ideas. However, in expressing them, we must always remember that we are the engineers. We are the individualists. We are the confident personalities. That is to say, it is understood in the mind of each of us that the future of professional engineering does not mean the future of any individual, or of any group,—the group even less than the individual. Thus reasoning, when we speak of the future of professional engineering we mean the future for engineering work. Immediately we can see the dawn.

We see it without having to describe it. Without having to explain it in terms, say, of the Works Progress Administration, the Public Works Administration, the Securities and Exchange Commission, the American Telegraph and Telephone Company, the General Motors Corporation, the United States Steel Corporation, or any other organization; also without having to explain it in terms of the world price of gold, the Fisher Commodity Index, or the average rate of interest on first-class bonds.

The future of professional engineering lies in the assumption that the lessons of the prolonged depression have been learned more thoroughly by the professional engineer than by anyone else. In his environment during the past years, the professional engineer secretly found himself to be a "mental anchor" for his individual community. He has viewed the storm, understood it, inwardly laughed at it and defied it

(*Continued on page* 23)

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And now back for a moment to the two-blades-of-grass idea. The real situation is that engineering is more often the art of making *one* blade of grass grow where none grew before, and it is also the art of determining the conditions under which a blade of grass will not grow at all! In other words, in this era of universal belief that nature and natural materials exist only for the use of mankind, while seemingly unlimited sums of money begging to earn interest in new and novel speculations in inventions, are available, the work of the professional engineer is highly valuable in recommending grass is not desirable in every place.

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Not many professional engineers have committed suicide as a way out of depression-mania. Many lawyers, doctors and bankers have. Propaganda engineering societies—there are such things—would say that this is an evidence of the time-honored sense of inferiority which they have claimed the engineer suffers interminably. Yes, for years within the memory of all of us, the engineering societies have invariably pictured the engineer as a man who was passed by when it came to salary increases and assignment to the best jobs available in the business corporations, simply because he had not received full recognition from the public!

In this era, some leaders in professional engineering —fortunately only a few—found stepping stones to high office in the organizations by capitalizing this alleged inferiority of the individual engineer. They would not have done so had not the societies succumbed to the so-called democratic principle in their election of officers, and thus made it easy for the charlatans to be escorted to the rostrums of the societies, and in return for the honors conferred upon them, orate large groups of otherwise manly citizens into believing that their profession had been incurably hexed by the whole community outside of engineering.

Some thinking engineers of the present-day, sense that certain engineering societies have waned considerably. Others just as reflective are sure that the societies are as "strong" as formerly, and that it is the influence and opportunity of the engineer himself that have waned. You can take your choice as to which of these groups of thinkers you feel with. However, it is quite certain that the mental capacity of a professional engineer has by whatever evolution become a fairly standardized thing. Not that there are not good and bad engineers, but rather that the quality of a professional engineer is not determined by the quality of a professional engineering society, nor by the quality of the community at large.

In plain words, an engineering mind is an entity. This must have been so for a very long time, in fact long before there were any engineering societies or any license laws. If you are an engineer, you know what the inherent qualities of the engineering mind are. You know, for example, that this mind is fundamentally honest. It is uncompromising on principle; the principle may be wrong scientifically, but it is never wrong morally. This mind is very rational, and in fact next to fundamental honesty, rationality is probably dominating. Yet, of course, there are engineers who are inventors, and hence can generate irrational ideas. But after generation, the development of the idea is carried out along lines of extreme and austere rationality.

Reiterating,—the present-day professional engineer is as complete a personality and as fully possessed of the faculty of responsibility as any member of any orientated group in the community. Moreover, the professional engineer is the *least* orientated and the least obsessed, as it were, of any of the professional types. In the parlance of the day, a professional engineer "gets to know what it is all about." He may not be able to do anything about "it," but that makes no difference. He can always sit still and think and await the king's pleasure; and anyone who knows how

to await the king's pleasure can qualify for the kingship himself.

Some Explanations of Organization Phenomena

Though it has been implied that the professional engineer is to an unsuspected degree independent of his organizations, nevertheless to the extent to which his material welfare is bound up with that of his employer, and to the extent to which the employers of engineers essay as it were to maintain a "buyer's market" for engineers' services through influencing the societies, the professional engineer needs must understand and interpret organization movements.

In the light of this observation, the objectives of the forces behind the 'Engineers' Council for Professional Development" which were discussed in the July issue of *The American Engineer,* stand revealed in a new way. As this author has contended elsewhere, these objectives are purposeful in limiting the supply of men who "offer their services in the engineers' market." In this light, the work of the E. C. P. D. is largely self-contradictory. Business corporations, requiring an ever increasing number of engineers, and only able to control the cost of engineering services when the supply of engineers is greater than their requirements, are hardly doing the sensible thing by jacking up the standards of admission to their favored societies.

On the other hand, it is unquestioned that an engineer ought really to be an engineer.

However, a further inconsistency in the operations of the E. C. P. D. arises from the fact that all the so-called professional engineering societies which compose it have become what can be adeptly described as "engineering data organizations." They constantly receive and publish engineering data given them by business corporations. The fact that these data are presented in the form of technical paper published in Transactions under the author's names for the purpose of "giving them standing in the profession" does not make the data any less commercial. While everyone surmises this of course no one says so. Everyone does know however that there are very few data today that are not commercialized or on the way to be so as soon as they are published.

The standing that a member gets from presenting a technical paper is simply a vestige of an honorable custom. It is interesting to note that in at least one case in this country, the said honorable custom was patently initiated by a commercial agency. This reference is not meant to be derogatory in any way. It merely states a circumstance which at the time undoubtedly helped to start some engineers on the road to what they have since become. Further, many organizations have since been started in the same way and one might properly say are being started in the same manner every day. Of late, however, we are accustomed to "sponsored programs" on the radio—and we don't think less of Amos 'n' Andy because of Pepsodent, nor probably less of Pepsodent because of Amos 'n' Andy.

Regardless, we are still left with the stimulation that the professional engineer is today a basic individual. Whether he would have more work if the E. C. P. D. were not taking up program time at the conventions of his societies, or if the remaining States were to enact license laws,—these may or may not be pertinent conditions.

However, there must be basic reasons why the last few years have witnessed so great an acceleration in the licensure movement. One of these may be that public authorities independent of the desire of the engineer and his organizations, have themselves decided that a professional engineer is entitled to the same protection of his practice as that enjoyed by other professionals. Another may be that the public is now more concerned over the safety of engineering works. Still another is that the engineering data societies have undoubtedly lost their appeal to those engineers who traditionally expect their organizations to be always doing something to promote their welfare; these societies have not had the financial resources, nor, in some cases, the intelligence.

Whatever the reasons may be—the fact remains that the licensure movement has manifested a great development—as is evidenced by the existence of this very journal and of the National Society of Professional Engineers which is sponsoring it. The journal has been criticized perhaps, but it should not be; though new, it is functioning. It offers its columns to the professional engineer who has something to contribute and invites him to utilize its services. It has a future.

The Future of Professional Engineering

Let us return to the main heading which this article bears, prepared to offer a few speculations. What is the future of professional engineering? We all have ideas. However, in expressing them, we must always remember that we are the engineers. We are the individualists. We are the confident personalities. That is to say, it is understood in the mind of each of us that the future of professional engineering does not mean the future of any individual, or of any group,—the group even less than the individual. Thus reasoning, when we speak of the future of professional engineering we mean the future for engineering work. Immediately we can see the dawn.

We see it without having to describe it. Without having to explain it in terms, say, of the Works Progress Administration, the Public Works Administration, the Securities and Exchange Commission, the American Telegraph and Telephone Company, the General Motors Corporation, the United States Steel Corporation, or any other organization; also without having to explain it in terms of the world price of gold, the Fisher Commodity Index, or the average rate of interest on first-class bonds.

The future of professional engineering lies in the assumption that the lessons of the prolonged depression have been learned more thoroughly by the professional engineer than by anyone else. In his environment during the past years, the professional engineer secretly found himself to be a "mental anchor" for his individual community. He has viewed the storm, understood it, inwardly laughed at it and defied it

(*Continued on page* 23)

ITEMS OF GENERAL INTEREST

NEWS, REPORTS, COMMENTS

NATIONAL SOCIETY ACTIVITIES

Correspondents and readers are invited to submit for publication items of interest to the professional engineer of the country. Such material should be forwarded as quickly as possible in order to keep news up to date.

WASHINGTON NEWS

Society Urges Interior Measure

In the official report of the hearing on changing the name of the Department of the Interior to that of a Works Department, there appears the following:

"STATEMENT OF W. S. CONLON, REPRESENTING NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS, WASHINGTON, D. C."

Mr. Conlon: Mr. Chairman and gentlemen of the committee, on behalf of the National Society of Professional Engineers, I wish to approve of the bill with one exception. The engineers recommend that the word "Public" precede the word "Works," to make this Department coincide with the usual understanding of departments of public works throughout the States and municipalities.

The Chairman: I think it means that, anyway.

Secretary Ickes: "Works" is the way it is in the bill. I think that is the way it ought to be. We want to keep it as brief as possible, consistent with expressing in the title what it means.

The Chairman: But it is bound to be public works, Mr. Secretary.

Secretary Ickes: Yes.

Mr. Conlon: There may be a misunderstanding, or the impression may be gained that it does not convey the usual meaning of the words "public works." For instance, all departments having the same functions as this Department is planned to have, are known as "departments of public works."

The Chairman: It is all public works. Any construction the Government does is public construction. I think probably the Secretary will have no objection to putting the word "Public" in before the word "Works."

Secretary Ickes: No objection, except that it lengthens the title unduly.

Senator Nye: Does the witness conceive some line of endeavor that would be covered by the word "Works" that would not be covered by the words "Public Works?"

Mr. Conlon: No; but it seems to be half a title. The title now is "Department of Public Works" in all State and municipalities.

The Chairman: It is merely the use of a word.

Mr. Conlon: That is all. Otherwise, we are heartily in favor of the bill.

The Chairman: All right. Thank you very much, Mr. Conlon.

We will adjourn at this time, to meet next Tuesday at 10:30 a. m.

(Whereupon, at 12:15 p. m., an adjournment was taken until Tuesday, July 16, 1935, at 10:30 a. m.)

LICENSED ENGINEERS

Society Endeavors to Secure Requirement

Supplementing the efforts of Secretary Conlon, President Steinman of the National Society has appealed to Secretary Harold L. Ickes and to Administrator, Harry L. Hopkins to recognize the propriety of requiring that only licensed engineers be selected for the preparation of plans and technical reports. The replies are significant. Attention is specifically directed to the final paragraphs of the letters of E. W. Clark, Executive Assistant to the P.W.A. Administrator and Perry A. Fellows, Acting Chief Engineer, W.P.A.

Following are some exchanges on the subject:

July 15, 1935

Hon. Harold L. Ickes, Administrator,
Federal Emergency Administration of Public Works,
Washington, D. C.

Dear Sir:

We are writing respectfully to request that, in your directions to the various State Engineers or Administrators, you require that plans and reports on projects other than those of a superficial character be prepared and submitted for the applicant by a Licensed Professional Engineer. This request applies particularly to the thirty-three states in which engineers' registration laws are now in force. For your information, we enclose herewith a list of these thirty-three states. Under the statutes it is unlawful for any but a Registered Professional Engineer to prepare engineering plans and reports. The ruling we are requesting is already being followed by one or more of the State P.W.A. offices, and your uniform instructions to the P.W.A. offices in all of the thirty-three states will serve to establish a uniform procedure complying with the respective state laws. Your cooperation in this matter will be appreciated by the engineering profession.

Faithfully yours,
D. B. Steinman,
President.

Washington, D. C.
July 22, 1935

Mr. D. B. Steinman, President,
National Society of Professional Engrs.,
117 Liberty St.,
New York, N. Y.

My dear Mr. Steinman:

This is to acknowledge your letter of July 15th, in which you request that the Public Works Administration will give directions to the various State Directors requiring that plans and reports on pro-

(*Continued on page* 21)

GUSTAV LINDENTHAL

Engineer, Artist and Philosopher Passes to His Reward
July 31, 1935

With the passing of Gustav Lindenthal the nation loses a great man and the profession a great engineer. Possessed of a magnificient intellect Mr. Lindenthal was also endowed with an unwavering courage of conviction. Born in Austria on May 21, 1850, he came to America in 1874. His ability as an engineer and his unusual imagination carved for him a career unexcelled in the annals of the profession. The accomplishments of Mr. Lindenthal are too well known to engineers to call for repetition here. The press has carried his achievements to every part of a world which is the poorer for his departure. The American Engineer conveys to his family the profound regrets of those who regarded him as a giant amongst his fellows.

The versatile mind which was his, was perhaps never better expressed than in a product of his declining years, a brief of which appeared in the American Engineer of January 1934. No finer tribute could be paid to a truly great man by this humble publication than to reproduce in full on page 6, "A Scientific Money System—by Gustav Lindenthal."

PROTEST ON W. P. A. SALARIES

Society Urges Modification

The question of the salaries to be paid engineers in connection with the W. P. A. program calls for action from all states. Any attempt to differentiate between employees attached to the W.P.A. staff and those attached to other public agencies should be strenuously opposed. In many, if not most, instances, the federal group is the contractor performing work planned and supervised by local agencies.

The following letter from President Steinman together with a reply thereto is published with the request that each State Society supplement the same by an appeal to Washington and to local authorities:

July 27, 1935

Mr. Harold L. Hopkins,
Federal Works Progress Administrator,
Washington, D. C.

Dear Sir:

Under the executive order of May 20, 1935, issued by the President, "Prescribing rules and regulations relating to wages, hours of work, and conditions of employment," etc., a schedule of established rates of earnings limited the maximum to be earned by professional and technical men to $94.00 per month. Two exceptions only to this schedule are permitted, namely, (1) a 10% latitude to be

(*Continued on page* 23)

STATE ACTIVITIES REPORTED

REGISTRATION AND SOCIETY NEWS

The American Engineer again asks the several States to submit material for each issue. Every Society is invited, in fact urged, to present full reports of the activities of Chapters or affiliations. Correspondents are requested to forward news items immediately after meetings or occurrences take place.

OREGON

Professional Engineers' Meeting

From Robert E. Duniway, Secretary, comes a report of the regular quarterly meeting of the "Professional Engineers of Oregon" recently held at the Public Service Auditorium in Portland.

Excerpts from the minutes of the meeting are noted herewith:

"In his opening remarks, the President reviewed the work of the Society since the first of the year. He also stated that the Board decided to have quarterly meetings to be held on the second Wednesday of March, June, September and December, instead of monthly meetings as had been originally contemplated. The Luncheon committee has been holding luncheon meetings for the membership each Tuesday noon and these have been very successful. Programs at the luncheon meetings, discontinued during the summer, will be resumed in September; in the meantime, many of the members enjoy getting together without formal call.

At the meeting there was on exhibit a very handsomely constructed model of the power house, spillway dam and adjoining property at the site of the Bonneville Project. This model is the work of a member, David Donaldson, who had explained it to many of the members present. Mr. Merwin thanked Mr. Donaldson for bringing the exhibit.

At this time the Secretary was requested to read the minutes of the previous meeting and, there being no corrections, these minutes were approved as read. Mr. Merwin then mentioned the objects of the Society and the efforts of the Board to secure greater activity and usefulness of the organization so that all members will derive an adequate benefit from their participation in the organization. The main reason for organizing, it was recalled, is to support the engineering registration law. In view of the fact that dues are now only $2.00 per year, it seems reasonable to suppose that our membership will have no difficulty in keeping paid up to date. The many federal works that are in the course of construction have, to a considerable extent, afforded employment for most of the well-qualified engineers and the new appropriation by Congress for further public works would seem to indicate that most engineers will have satisfactory employment for some time to come. In view of the improved situation and the modest dues now required of members it is hoped that everyone will keep in good standing from now on. Mr. Merwin then summarized a report of the Secretary indicating that during the year 1935, $205.55 has been collected. Of this amount $158.00 is for 1935 membership cards issued to 79 members in good standing; $4.75 for recognition pins and $42.80 for delin-

(*Continued on page* 18)

PENNSYLVANIA

Pittsburgh Chapter Formed

At a meeting held at the Fort Pitt Hotel, in Pittsburgh, a western Chapter of the State Society was launched on July 22nd. J. Edgar Hires, Vice President of the Philadelphia Chapter, who was greatly aided by R. C. Scott, Chairman of the Membership Committee, reports more than 50 signatures for membership.

The Charter members of the Pittsburgh Chapter are:

Benjamin H. Aires, 610 Maloney Bldg., Pittsburgh, Pa.; Harry G. Appel, 744 Lillian Street, Pittsburgh, Pa.; E. E. Appel, 508 Gulf Bldg., Pittsburgh, Pa.; Harry V. Archer, 322 Breading Avenue, Pittsburgh, Pa.; Miles G. Bigley, 3247 Eastmont Avenue, Dormont, Allegheny Co., Pa.; Louis Paul Bilotta, 1215 Hodgkiss St. N. S., Pittsburgh, Pa.; William J. Bruner, 3254 Orleans Street, Pittsburgh, Pa.; George T. Bruun, 323 S. Lang Avenue, Pittsburgh, Pa.; Charles N. Carten, 400 Broadmoore Avenue, Pittsburgh, Pa.; John Colaianni, 259 Broadmoore Avenue, Pittsburgh, Pa.; Daniel E. Davis, 813 Clark Bldg., Pittsburgh, Pa.; Robert Bain Dell, P. O. Box 843 Duquesne, Allegheny Co., Pa.; Robert M. Douglass, 912 Columbia Bank Bldg., Pittsburgh, Pa.; Chester F. Drake, Filtration Plant, Aspinwell, Allegheny Co., Pa.; Alexander Dzubay, 246 Laurel Avenue, Bellevue, Allegheny Co., Pa.; Walter N. Flanagan, 3248 Eastmont Avenue, South Hills, Pittsburgh, Pa.; Walter H. Frick, 607 Hampton Avenue, Wilkinsburg, Allegheny Co., Pa.; Clarke Kennerley Harvey, 620 County Office Bldg., Pittsburgh, Pa.; George Hunt Hutchinson, 607 Clearview Avenue, Crafton, Pittsburgh, Pa.; Roman Byron Hutton, Castle Shannon, Allegheny Co., Pa.; Richard Irwin, Vandergrift Bldg., Pittsburgh, Pa.; Benedict J. Kaiser, 324 Fourth Avenue, Pittsburgh, Pa.; Fritz Kubitz, Library, R.F.D. No. 1 near Pittsburgh, Pa.; Earl F. Lansinger, P. O. Box 1812, Pittsburgh, Pa.; Frank J. McWade, 1257 Wisconsin Avenue, Dormont, Pittsburgh, Pa.; M. C. Milholland, 1115 Bessemer Bldg., Pittsburgh, Pa.; Emmett H. Moore, 119 Emerson Avenue, Aspinwall, Allegheny Co., Pa.; Rudolf F. Nagel, 1322 Evergreen Avenue, Midvale, Allegheny Co., Pa.; Roy Stevens Quick, P. O. Box 214, Pittsburgh, Pa.; James H. Reniers, 6609 Church Avenue, Ben Avon, Pittsburgh, Pa.; Frank Weyman Ritchey, 302 South Fairmount St., Pittsburgh, Pa.; Brabason Rutherford, 633 Clyde St., Pittsburgh, Pa.; Alexander F. Trimble, 82 North Harrison Ave., Bellevue, Pittsburgh, Pa.; Alf Winning, 1420 Frick Bldg., Pittsburgh, Pa.; Harry Wohlwend, 1029 Greentree Road, Greentree Crafton, Allegheny Co., Pa.; James R. Hess, 257 Newburn Drive, Mt. Lebanon, Pittsburgh,

(*Continued on page* 18)

NEW YORK

By

RAPHAEL J. SMYTH

New York City Salary Schedule

The schedule of salaries adopted by the joint committee representing the Chapters of New York City is ready for publication. This schedule applies to engineering personnel generally and was prepared for recommendation to the Works Division of the E.R.B. for observance.

Space requirements will not permit its printing in this issue; it is hoped that it will be possible to print it in the September issue.

D. B. Steinman, reappointed

Engr. D. B. Steinman, Chairman of the New York State Board of Examiners for Professional Engineers and Land Surveyors, whose term of office as a member of the Board expired on August first, has been reappointed by the State Board of Regents to serve an additional term of three years to August 1st, 1938.

WESTCHESTER COUNTY

The Westchester County Chapter recently sent out a questionnaire to the 800 professional engineers in Westchester County some of the results of which appear in the following tabulation.

All Professional Engineers	
Members of State Society of P. E.	50%
Non-Members of State Society of P. E.	50%
	100%
All Professional Engineers	
In Private Practice	22%
Not in Private Practice	78%
	100%
Engineers in Private Practice	
Employed	41%
With T. E. R. A.	9%
Unemployed	50%
	100%
Engineers not in Private Practice	
Employed	73%
With T. E. R. A.	9%
Unemployed	18%
	100%
All Professional Engineers	
Employed	66%
With T. E. R. A.	9%
Unemployed	25%
	100%

The tabulated returns indicate that, in Westchester County, the 22% of the professional engineers who are normally engaged in private practice have been particularly hard hit by the depression and that 25% of the engineers who were engaged in private practice and public service are still unemployed. In the face of these facts the continued employment,

(*Continued on page* 20)

OREGON

(*Continued from page* 17)

quent dues collected. Expense of the Society thus far this year has been $90.81, which leaves a balance on hand of $114.74. The Treasurer had on hand at the beginning of the year $170.00, so that the Society now has resources of $284.74, which is considered a very favorable showing. Eight new members have been elected to membership thus far in 1935 and it is to be hoped that additional new membership applications will be received during the year. The Secretary's report stated that there are on the records a total of 191 members, of whom 79 are paid up to date, 84 who are delinquent, and 28 who have both become delinquent and failed to maintain registration. The total number of registered professional engineers in the State is 710 and the Society has about 160 of these who can apparently be expected to maintain their registration and membership in good standing. Mr. Merwin mentioned that the Oregon Bar Association has recently passed a law compelling practicing lawyers to join the Bar Association. Possibly engineers will want to consider some similar action at a future date.

This year two or three vacancies will occur on the Oregon Engineering Examining Board and the Technical Council has appointed a committee to discuss the new appointments with Governor Martin. Mr. Merwin had been invited to act on this committee and he requested an expression of opinion from the Society as to whether he should accept the appointment. Mr. J. C. Stevens answered this inquiry and said that he considered it very urgent for Mr. Merwin to accept the same as he felt the Professional Engineers of Oregon should be represented when the filling of vacancies on the Examining Board was being considered. A motion was made, seconded and passed requesting Mr. Merwin to serve on the committee. As announced once or twice during the year, the Board of Directors has had under consideration the selection of a publication to be designated as the official magazine of the Society and they have been invited to consider the Oregon Technical Record, published by students on the campus at Corvallis. A copy of this publication was circulated among the members present and Mr. H. R. Patterson, Jr., Professor of Forestry at Corvallis, supplemented the Secretary's recommendation that this publication be accepted as the official periodical. Mr. Fred Weber moved the approval of the publication as official periodical until further notice. This motion was regularly seconded, and passed. Mr. J. C. Stevens stated that after adopting a publication, a serious effort to have a worthwhile column of news representing this Society should be made and the news should include; notice of examinations to be held by the Examining Board; list of those who have successfully passed the examination; notice of both regular meetings and directors' meetings of the Society, and a brief of the minutes of such meetings of interest to Professional Engineers.

Mr. Weber reported that the new engineering registration law in the State of Washington does not require mining engineers to register and he is apprehensive that Washington mining engineers practicing without registration in that state may request reciprocal registration in Oregon without examination It was the opinion of most of those present that this was a problem for the Examining Board and did not require action at this time.

Mr. Merwin called attention to several letters received from the National Society of Professional Engineers in Washington, D. C., transmitting a printed copy of House Bill No. S2665 which calls for changing the name of "Department of Interior" to "Department of Conservation and Public Works." Mr. J. C. Stevens said that during the Hoover administration engineering societies attempted to have established a Department of Public Works as an additional cabinet office and that President Hoover was favorable to the idea. However, after more or less constant effort the thought was given up and Mr. Stevens is doubtful whether anything much can be done without long extended effort. Mr. Merwin advised that he would appoint a committee to look into the subject and report back at the next quarterly meeting.

The address of the evening under the title "Timber for Economic Permanence" was presented by Mr. R. E. Cushman. The speaker showed various exhibits, including a number of termites in a glass jar, several pieces of decayed timber and pieces of timber which had been treated with creosote. He called attention to the fact that timber is constantly growing and replacing itself so that the supply will never be seriously depleted and he pointed out that timber is more easy to judge from a casual personal inspection than many other types of material; in short, a person can tell by looking at it whether it is sound or not. During recent years various improved ring plate connections and metal connectors have been designed for use in timber so as to improve its utility as a structural material. He said that it is well known to timber designers that the normal moisture content is around 24% and that each 4% decrease in moisture will produce 1% shrinkage. This information and the general thorough understanding of the property of wood make it easy material for the designer to utilize.

Mr. Cushman stated that in 1838 research was begun on the subject of wood preservatives and that in the intervening years, out of countless experiments, two methods have developed which are preeminently successful. The zinc chloride treatment and the creosote treatment are now the only two generally recognized methods of wood preservation. He also stated that in recognition of the success of wood preservative materials, the Pacific Coast Building Congress has recommended a change in the building code which would allow piling under permanent structures to extend above the ground water line instead of requiring that they be cut off and capped at the level as has previously been the practice. Mr. Cushman introduced Mr. R. H. Rawson, who explained the technique of treating timber with creosote as exemplified at the plant of the Charles R. McCormick Lumber Company of St. Helens, Oregon. Mr. Rawson's talk was illustrated with reels of moving pictures taken at the plant.

Major F. R. Schank stated that before the war he was employed in the Interior Department.

President Merwin expressed pleasure and appreciation at the number of prominent members who had attended the meeting and expressed hope for a good attendance during the following season."

PENNSYLVANIA

(*Continued from page* 17)

Pa.; W. L. Keller, 1239 Gakmont Street, Crafton, Pittsburgh, Pa.; Alexander A. Nelson, 108 Library Place, Duquesne, Allegheny Co., Pa.; Roy Lee Smith, 1449 Koppers Bldg., Pittsburgh, Pa.; John C. Williams, 3865 Brighton Rd., N. S., Pittsburgh, Pa.; John Earl Frazier, 1028 Washington Trust Bldg., Washington Co., Pa.

Harrisburg and Wilkesbarre

Organization of chapters in these localities is in progress. Reports indicate that definite steps, to complete the formation of bodies, will be taken in August.

Architects Efforts Fail

From the report of A. C. Fisher, the following has been copied:

"Referring to the Architects bill, H. R. No. 1750, introduced at the legislature in Harrisburg, Pa., we are glad to state that due to the efforts and vigilance of the State Society this bill never emerged from committee, and as the legislature has adjourned, it will be necessary to reintroduce the measure at the next session, which will not take place for a period of two years before further consideration can be given the same."

Federal Appointments

Publicity Chairman Fisher advises that the following telegram was forwarded to

"Edward N. Jones,
State P.W.A. Administrator,
Harrisburg, Pa.

We urge the appointment of registered professional engineers only as district works progress administrators.

Pennsylvania Society of
Professional Engineers,
T. W. Battin, President,
921 Widener Building, Philadelphia, Pa.

As the work of these administrators will be largely technical and executive in nature, it is felt that the best interests of the country and state, as well as the engineering profession at large will be served if only qualified professional engineers, adopted by their training and experience to such work, are appointed.

NEW JERSEY

Association Opposes Pay Discrimination

The question of different salary schedules for engineers rendering equal services in connection with the Works Progress Administration has aroused great concern amongst the profession in this state.

Excerpts from a recent communication by Gerald W. Knight, Technical Advisor to the Governor, states the case in a clear cut fashion:

"It is obvious, therefore, that the professional and technical men who are and may be chosen to go on the administrative staff are the only ones to receive substantial consideration in the way of salaries. These men, the preferred ones at administrative headquarters, are so vastly outnumbered by the other technical men throughout the state, doing the same kind of work and charged with equal responsibility, that the unfairness of the thing is at once obvious. Under Section 16 of Circular No. 1 and Item (f), "Supervisory and Administrative Employees," according to Mr. Compton, lies the only possible substantial deviation from the schedule. Therefore, all supervisors, superintendents, works man-

agers and similar key men, wherever found, outside of administrative headquarters, will be reduced in their compensation and not increased. The executive order fixing this schedule, which is applicable to all states, will or may not be changed, in the opinion of this writer, unless its unfairness is brought to the attention of the President or Mr. Hopkins in an organized way.

This matter has been brought to the attention of the executive officers of the N. J. State Association of Prof. Engrs. and Land Surveyors and brought to the attention of the architects of the state. A meeting of the Executive Board of the Engineers was called for Tuesday evening, July 30th, at 7:00 P. M. at the Hotel Douglas, Newark, N. J., for the consideration of this matter.

Mr. Knight and the New Jersey Association are to be congratulated on their endeavors.

FLORIDA

Registration and Federal Work

Florida is encountering the same difficulty as many other states in the matter of recognition of license laws by Federal Authorities. As long as the national government supplies the funds and directs their expenditure, state laws cannot be completely invoked. Federal employees are not subject to state control.

This is a problem for the National Society to attack at its source, viz., Washington.

VERMONT

Registration Proposed

The National Society of Professional Engineers, as well as the New York State Society of Professional Engineers, has had exchanges with representative engineers of Vermont on the subject of registration. The National Society is prepared to aid in a legislative campaign and President Steinman and Secretary Conlon have agreed to visit Vermont representatives in the near future to aid in formulating a program of legislation.

OHIO

Prepares for Convention

Plans for the first annual meeting of the National Society are being carried forward by Perry Ford, Chairman of the Convention Committee, and Secretary John Laylin of the Ohio Society.

National Secretary Conlon, who visited Columbus on August 1st, was much impressed by the activity of the profession throughout the state and expresses hope for a convention unsurpassed in the annals of the profession.

An invitation to address the convention has been extended to Mr. Durand W. Springer, of Washington, D. C., Secretary and Executive Member of the American Society of Certified Public Accountants.

OHIO SOCIETY REPORT

(*Continued from July Issue*)

Division D.—Cleveland Association of Professional Engineers Committee Proposed Schedule of Proper Minimum Charges for Mechanical and Electrical Engineering Services.

Note: The following schedule of fees has not been adopted by the State Committee but is submitted as a standard for consideration and adoption after such modification as may be desirable for each zone.

	To Owners		To Architects or Engineers	
	New Bldg. Work	Alterations or modernizing existing bldgs.	New Bldg. Work	Alterations or modernizing existing bldgs.
(a) Preliminary surveys	1%	2%	0.50%	1.00%
(b) Plans and specifications	3%	4%	2.50%	2.50%
(c) Complete supervision	2%	2%	1.50%	1.50%
(d) Complete service	6%	8%	4.50%	5.00%
(e) Partial supervision	1%	1%	0.75%	0.75%

1. The following schedule of charges is to be considered the minimum for which an engineer in private practice shall perform his services, such charges to be increased with increased ability, experience, complexity of the work, and reputation of the engineer.

Schedule I.

The rate of percentage as indicated in b, c, d, and e are to be interpreted as meaning a basic rate computed on the total of the contract sums incurred for the execution of the work, not including engineer's fees. Engineer's estimated costs shall be the basis for the fee if proposals by contractors for the work have not been received.

2. Schedule II.

The engineer is to be reimbursed in addition to the above percentages for all actual costs of transportation and subsistence expenses incurred by him and his assistants while traveling in discharge of duties connected with the work other than expenses between engineer's office and/or client's place of business or job.

3. Schedule III.

Testimony and preliminary investigations in connection with court service per day or fraction thereof to be made on a basic charge of $50.00 plus traveling and subsistence expenses.

4. Schedule IV.

Consultation, examinations, reports and/or designing service to be made on a basic charge of $40.00 per day or $5.00 per hour plus traveling and subsistence expenses or on a cost plus basis computed on engineer's actual payroll costs plus one hundred per cent (100%) of such cost for overhead expense.

Explanation of Schedule I.

5. (a) Preliminary survey fees may be made as a lump sum charge when based on an equivalent to the above percentages computed upon a reasonable estimated cost of the work.

(b) Plans and specifications shall include, necessary conferences, the preparation of complete working drawings and specifications, the drafting of forms of proposals and contracts, the checking of shop drawings and advice regarding approval of materials.

(c) Complete supervision shall include complete superintendence of the work.

(e) Partial supervision shall include the final inspection of the work in addition to inspection during the execution of the work when called for by owner or architect, but not to exceed more than two (2) inspection trips per month. Any further inspection trips called for by the owner or architect to be charged for at the rate of $5.00 per hour plus traveling and subsistence expenses.

6. These fees for plans and specifications do not include charges for redesign after the engineer's drawings are once completed and ready for estimates. If after the drawings and specifications for the entire work or any sectional part of the work are completed in accordance with instructions of the owner or architect, it should be necessary for the engineer to revise these drawings and specifications for any reason other than changes caused by errors on the part of the engineer, he shall be paid by the client employing him for changing his drawings and specifications, an additional fee based upon his actual payroll cost plus 100% of such cost for overhead expense. If for any reason after the engineer's drawings and specifications are completed, the work is abandoned or ceases for any reason, the engineer shall be paid the amount stipulated for each stage of the work completed by him, with a partial payment on any uncompleted stage proportional to the amount of work done on such stage.

Committee for Standardization of Engineering Practices

Chairman, Wendell P. Brown, 823 Prospect Ave., Cleveland.
Zone I. Wm. C. Kammerer, 823 Prospect Ave., Cleveland.
Zone II. C. S. Finkbeiner, 1025 Nicholas Bldg., Toledo.
Zone III. G. Gale Dixon, Home Savings and Loan Bldg., Youngstown.
Zone IV. Waldo Hartline, 116 Fair Ave., New Philadelphia.
Zone V. E. A. Lawrence, Rowlands Bldg., Columbus.
Zone VI. Fred J. Cellarious, 36 E. First St., Dayton.
Zone VII. Arch E. Campbell, Oak Hill.
Zone VIII. Bruce E. Maxon, 602 Greenwood Bldg., Cincinnati.
Secretary, Perry T. Ford, Wyandotte Bldg., Columbus.

7. There shall be a free interchange of blueprints between the engineer and owner or architect concerned with the design of a project during the planning stage. When the engineer's drawings and specifications are completed and ready for bidding, he will furnish at his expense six sets of plan blueprints and six sets of specifications. For all other blueprints and specifications required for the project, he shall be reimbursed for the actual cost to him for such.

Division E.—Standard Form of Agreement Between Owner and Engineer for Professional Services.

1. This agreement made at _____, Ohio, this _____ day of _____ in the year _____ by and between _____ _____ _____ hereinafter called the owner, and _____ _____ hereinafter called the engineer, witnesseth, that whereas the owner intends to construct _____ (following to be printed in small letters) (include statement of legal authority of the owner to proceed in the case of municipal or other public or political subdivision officials) _____ _____ _____ _____

Now, therefore, in consideration of these

premises and of the mutual covenants herein set forth the owner and the engineer mutually agree as follows:

2. The engineer agrees to furnish and perform the various professional services required for the construction of above named improvement as follows:

a. Preliminary investigations, studies and reports, preliminary general plan or plans, approximate estimate of cost and all necessary conferences with the owner.

b. Complete general and detail plans, specifications and detailed estimate of cost.

c. Prepare forms for construction proposals, advertisements, construction contracts and bonds, subject to the approval of the owner.

d. Receive and tabulate proposals, report same to the owner, and assist in awarding contract for construction.

e. Furnish general supervision of the work of the contractor as the construction progresses, to assist in a correct interpretation of the plans and specifications and to safeguard the owner against defects and deficiencies on the part of the contractor but the engineer does not guarantee the performance of the contract by the contractor. (The general supervision of the engineer as to be distinguished from and does not include the resident personal supervision as hereinafter mentioned.) (Last sentence in small type.)

f. Furnish resident supervision including line and grade surveys and/or such other surveys or services such as resident inspection of construction as may be mutually agreed upon between owner and engineer, at actual cost to the engineer plus field, traveling, and "out of office" expense.

g. Furnish property, boundary, right-of-way or other surveys at the actual cost to the engineer plus field, traveling and "out of office" expense.

h. Furnish three (3) copies of reports, plans, (on paper) and specifications and furnish additional copies to the owner or contractor at cost. (Original documents, survey note and tracings are and shall remain the property of the engineer.)

i. Meet with the owner or his representatives when requested or necessary for consultation or conference.

j. Furnish and perform the supervision of work of inspection bureaus and laboratories in the inspection and tests of materials entering into the construction of the structure, receive, record, and pass upon by approval or rejection all reports by such laboratories or bureaus on the material tested for use in the structure, (n. b. the cost of all such tests and inspection by laboratories or bureaus to be paid for by the owner).

k. Furnish and perform the supervision of all test borings, sub-surface explorations or other investigations required for the determining of foundation conditions for the structure. (The costs of such borings, tests, explorations, or investigations to be paid for by the owner.)

l. Compute and determine the amount of special assessments if required by the owner. The cost of such service to be paid for by the owner at actual cost to the engineer or as by mutual agreement.

m. Prepare necessary plans and applications for permits for the submission to and approval of local, state, and Federal authorities (such as municipal building departments, state boards of health and etc.) as may be required for the initiation, prosecution and construction of the improvement. The cost of such permits to be paid by the owner but the cost of preparing such plans and applications shall be included in the fee paid the engineer.

n. Assist the owner when requested in negotiations with the owners of property required for or affected by this improvement, preparing all surveys, maps, plans, and estimates required for said negotiations. (The cost of this service to be paid for by the owner at the same rate as hereinafter specified for the principal engineering service under this agreement computed on the amounts finally agreed upon or finally determined as the actual compensation and/or damages to the owner of the property.)

(Line out all clauses, subparagraphs, or sentences not essential to this agreement.)

3. The owner agrees to pay the engineer as compensation for such professional engineering services ..... per cent of the entire cost of construction of the structure, to be paid as follows:

a. ..... per cent upon completion of the preliminary investigation, studies, preliminary general plan or plans and the approximate estimate of cost;

b. ..... per cent additional when working or contract plans and specifications with detailed estimate of costs are completed;

c. ..... per cent additional payable in ..... monthly payments, the first payment to be payable ..... months after the contract for construction has been awarded and the balance monthly thereafter until the aggregate of all payments shall equal the amount due under this agreement exclusive of any amounts that may be due for extra compensation provided for in this agreement (Art. III, par. d, e, f, h, i and k).

d. For any additional service required by the owner due to changes ordered by the owner or due to the delinquency or insolvency of the owner or contractor or as a result of fire or flood or act of God the owner shall pay the engineer the net cost of such additional service, cost equals net payroll and expenses plus 100% for overhead, readiness to serve, and profit, these payments to be due and payable from time to time as the services are performed or as costs are incurred.

e. Traveling or other authorized expenses incurred by the engineer or his assistants where traveling in the discharge of duties connected with these services other than expenses between the engineer's office and/or owner's place of business and/or the site of the improvement.

OKLAHOMA

Registration Board Appointed

On June 29th the Governor of the State announced the appointment of the members of the State Board of Registration for Professional Engineers.

The Board held its organization meeting on July 17th, and chose Engr. George J. Stine, of Miami, as Chairman, and Engr. William Furber Smith of Oklahoma City, who is Chairman of the Joint Engineering Legislative Committee, as Secretary.

The following report is from the Tulsa World of June 30th:

Selection of five state engineers to serve as members of Oklahoma's new state board of registration for professional engineers was announced today by Gov. E. W. Marland. The new board was created by the last legislature.

W. C. Rhodes of Tulsa was given the five-year term on the board, with F. R. Clonts of Muskogee going on for four years, J. F. Brooks of Norman for three years, B. S. Myers of Oklahoma City for two years, and George J. Stine of Miami for one year.

State Powers

Under new state law, the board must pass on qualifications of all professional engineers practicing in the state, with architects excluded from qualifying under the board.

Professional engineers now practicing and who have been residents of the state for one year prior to the new law, effective last May 13, may be issued certificates upon payment of a $25 fee. All engineers will be required to pay an annual license fee of $5.

Minimums Fixed

To obtain a certificate, the engineer must be at least 25 years of age and have eight years of actual practice. Each year of education at an approved school may be counted in place of one of the eight years of practice, with not more than five years to be granted for school training.

All engineers must be registered by next November 13.

Engineers exempt from the necessity of a certificate include employes of professional engineers, officers or employes of the government and employes of public service corporations not engaged in public practice.

NEW YORK

(*Continued from page* 17)

by governmental work relief agencies, of unlicensed men in the performance of engineering work is indefensible.

Congratulations are extended to the Westchester County Chapter, and its committee under the chairmanship of Mr. Andrew M. Anderson, upon this accomplishment. Like activities by all of the Chapters in the State would furnish highly voluable statistical information relative to the profession besides making available lists of qualified professional engineers who are unemployed.

DUTCHESS COUNTY

The Dutchess County Chapter has mailed to each licensed engineer and land surveyor in the county a questionnaire from which records of the qualifications and employment of all engineering licensees can be compiled and statistical tabulations prepared.

ALBANY COUNTY

The Executive Committee of the Albany County Chapter has formulated a schedule of Salary Bases for Engineers and Assistants and has recommended its observance by the P.W.A. organization in the Capital District.

It is hoped that space will permit it to be printed in the September issue of the magazine.

ERIE COUNTY

A systematic canvass of all non-member engineers and land surveyors in Erie County is being conducted by a membership committee composed of forty members. The committee is divided into eight teams of five members each; there has been assigned to each member the names of eight non-members who are eligible for Chapter membership; each committee member is charged with the respon-

sibility of personally interviewing each prospect, of advising him of the ideals of the society and of informing him of the notable advances which have been made toward their realization.

A copy of The American Engineer was mailed to each prospective member by the Society, so that it would be received in advance of the call of the committee member. The canvassers will distribute copies of the Society booklet entitled "Accomplishments and Objectives" to prospective members.

This is one of the most comprehensive and thoroughly planned chapter campaigns undertaken in the state and will undoubtedly be an outstanding success. Most cordial congratulations are extended to the Chapter and to the Membership Committee for the splendid effort that is being made.

The present officers of the Chapter are: Stewart S. Neff, President; Harry A. Stelley, Vice-President; Arthur B. Weaver, Treasurer; Elias H. Anderson, Secretary; they are all residents of Buffalo.

SUFFOLK COUNTY

The following report has been received through the courtesy of Mr. Rodney E. Cook, Secretary of the Suffolk County Chapter:

"Fifty-one members and guests of the Suffolk County Chapter gathered for their annual mid-summer outing and dinner at the sumptuous Montauk Manor Hotel, on Friday, July 12th, 1935. The dinner was preceded by a lively golf tournament in the afternoon from which "Bill" Hunninghouse and George Vaughan emerged as victors.

Mr. Fred Abel, Manager of the Hotel, provided a private dining room with perfect service for the dinner. The *piece de resistance* of the dinner was a delicious section of swordfish furnished by Perry B. Duryea of Montauk.

After the delightful meal a short business session was conducted by Mr. Fred J. Biele, President. Among the significant subjects of discussion were the publicity for the Chapter in the recent releases of the U. S. Coast & Geodetic Survey, the new platform of the National Society of Professional Engineers, a discussion of the recent meeting of the State Society of Professional Engineers by the several delegates, the possible adoption of a Plumbing Code for Suffolk County, and the proposed improvement of the Shinnecock Canal. It was unanimously resolved that the Chapter go on record in favor of the proposed completion of the dredging and improvement to the Shinnecock Canal.

Rousing resolutions of appreciation for the courteous provision of the splendid meeting-place were adopted and forwarded to Mr. Fred Abel, Manager of the Hotel, and to Mr. Thomas Ringwood, Receiver of the Montauk Beach Development Corporation, Director of the Chapter and Chairman of the Committee on Arrangements. The gift of the swordfish by Mr. Perry Duryea was duly and enthusiastically acknowledged.

The meeting was unanimously voted the most excellent and enthusiastic one of the Chapter's history of six years.

The next meeting will be held in September in conjunction with the Nassau County Chapter, at Lawrence, L. I.

The officers of the Chapter are: President, Fred. J. Biele, of Huntington; Vice President, William Hunninghouse of Huntington; Treasurer, A. S. Havens of Center Moriches; Secretary, Rodney E. Cook of Riverhead."

LICENSED ENGINEERS

(*Continued from page* 16)

jects other than those of a superficial character be prepared and submitted for the applicant by a Licensed Professional Engineer.

The Public Works Administration is not a construction agency itself, but makes loans and grants or grants only to the various Federal agencies and the political subdivisions of the Government.

The Federal agencies prepare their plans and specifications in accordance with and after the procedure which has been set up and in use by that agency in the past.

On the non-Federal projects, the Public Works Administration does not come into the picture until an application is made for a loan and grant. Since, in order to make an application a certain amount of investigation and planning has to be done, the applicants select the engineer or architect in accordance with their desire and regulations required by the law of the State, and the Public Works Administration does not have anything to do with the application until after the allotment is made.

Hence we cannot comply with your request to give specific directions to our Acting State Directors that they shall restrict applicants to using Licensed Professional Engineers unless the laws of the State in which the project is situated provide for such use.

Sincerely yours,
(Signed) Horatio B. Hackett
Assistant Administrator.

July 23, 1935

Mr. Horatio B. Hackett, Assistant Administrator,
Federal Emergency Administration of Public Works,
Washington, D. C.

Dear Mr. Hackett:

This acknowledges receipt of your letter of July 22nd in reference to the preparation of plans and reports included in applications submitted to the Public Works Administration. You state that you cannot comply with our request to give specific directions to your acting State Directors that they shall restrict applicants to using Licensed Professional Engineers unless the laws of the State in which the project is situated provide for such use. We have already supplied you with a list of 33 States in which the State Laws do provide for such use of Licensed Professional Engineers to prepare engineering plans and reports. By complying with our request to give the indicated specific directions to your Acting State Directors in those 33 States you will be facilitating the enforcement of these State Laws and cooperating with the efforts of the engineering profession toward getting these laws observed and respected. We shall appreciate your advice that the indicated specific directions have been issued to your Acting State Directors in the 33 States having Engineers' Registration Laws.

Faithfully yours,
D. B. Steinman
President.

Washington, D. C.
August 5, 1935
Eng. CMeD:AJB:HJS.

Dr. D. B. Steinman, President,
National Society of Professional Engrs.,
117 Liberty Street,
New York, N. Y.

My dear Mr. Steinman:

I have been giving considerable thought to your letter of July 23, following my letter of the 22nd, and am at somewhat of a loss to understand your insistence that we instruct Acting State Directors to enforce State laws on employment of licensed engineers.

Acting State Directors of the Public Works Administration are men familiar with the laws of their respective States and cannot authorize the expenditure of public money when such expenditure is in conflict with local statutes. I believe I indicated in my letter of July 22nd that this Administration does not assume authority over such matters in States where licensing laws do not exist.

I will be glad to have you or any representatives of the engineering societies throughout the nation call our attention at any time to instances of violation of the licensing laws on the part of the consulting engineers who have been hired to prepare engineering plans and reports for Public Works projects.

Sincerely yours,
(Signed) E. W. Clark
Executive Assistant
For the Administrator.

August 1, 1935

Dr. D. B. Steinman, President,
National Society of Professional Engrs.,
117 Liberty Street,
New York City, N. Y.

Dear Mr. Steinman:

Mr. Hopkins has requested this office to acknowledge your letter of July 15 relating to the requirement you propose that plans and reports on projects be prepared by Licensed Professional Engineers.

The rules and regulations of the work relief program place on the sponsoring agencies the responsibility for adequacy of design and conformance with local laws and regulations. The employment of engineers by the sponsors may be considered as part of their contribution and the selection of these engineers is a matter that rests with the sponsors; it is not subject to our dictation. The employment of engineers on projects as part of the project personnel is handled through the same channels that all other project personnel employment is handled; that is, through the United States Employment Service, and the men are drawn from a list of qualified unemployed. This includes all engineers, whether licensed or not, who may be employable but on relief.

Such engineers as the State Administration employs on the administrative staff will be selected from those competent to do the particular kind of work for which they are drawn and all relevant information will be considered in making their selection. This would, of course, include their standing as licensed engineers as well as other qualifications which would be checked.

Yours very truly,
(Signed) Perry A. Fellows
Acting Chief Engineer.

ENGINEERS' REGISTRATION

(*Continued from page* 13)

real estate brokers endeavored to monopolize the right to make appraisals. Such legislation has been consistently and successfully opposed by our profession. Suggestions to meet the situations by subdividing into specialties have also been consistently resisted.

Without our registration laws on the statute books, recording the rightful scope of practice of the professional engineer, our cause would have been lost. We would have been subordinated to other professions, our established field of practice diminished, and our profession dismembered.

The Model Registration Law

With the participation of all of the leading national and local engineering societies, a model registration law has been developed to serve as a guide for the drafting of new laws and the improvement of existing laws.

The definition of professional engineering, first written into the New York State law and then incorporated in the Model Law, is as follows:

"The practice of professional engineering within the meaning and intent of this Act includes any professional service, such as consultation, investigation, evaluation, planning, design, or responsible supervision of construction or operation, in connection with any public or private utilities, structures, buildings, machines, equipment, processes, works, or projects, wherein the public welfare, or the safeguarding of life, health or property is concerned or involved, when such professional service requires the application of engineering principles and data."

The minimum qualifications for registration as a professional engineer, also following the standard established in the New York State law, are:

"a.—Graduation from an approved course in engineering of four years or more in a school or college approved by the Board as of satisfactory standing; and a specific record of an additional four years or more of active practice in engineering work of a character satisfactory to the Board, and indicating that the applicant is competent to be placed in responsible charge of such work; or

b.—Successfully passing a written, or written and oral, examination designed to show knowledge and skill approximating that attained through graduation from an approved four year engineering course; and a specific record of eight years or more of active practice in engineering work of a character satisfactory to the Board and indicating that the applicant is competent to be placed in responsible charge of such work."

Registration laws introduced for enactment since 1932 have generally followed the Model Law closely as a standard. It has been a most helpful contribution toward uniformity.

The Model Law has had, in its preparation, the benefit of all past experience and the best constructive thought of the profession. It is offered as the best draft of a registration law thus far developed by the profession, with all legal requirements carefully observed. The "grandfather clause" is retained, protecting any established individual rights of practice, in order to remove the only objection that has ever been brought against such legislation on constitutional grounds; and a "saving clause" is included to preserve the validity of the rest of the law in the remote eventuality that any section in it might be declared invalid. The constitutionality of such legislation is now well established.

Registration Fees

The registration fee is not an occupational tax. It is not intended as a source of revenue to the state. The Model Law provides that all fees collected should be used for the administration and enforcement of the law. Fees vary, in the different states, from $5 to $25 for the original registration certificate and from $1 to $5 for annual renewal. Engineers should not begrudge this comparatively slight contribution to protect their professional investment.

The slight expense imposed on engineers as a registration fee is trifling in comparison with the benefits derived. Anything that raises the standards of qualification and recognition of the profession benefits all engineers in it. The man who has invested thousands of dollars in education and many years of his life in training for the profession, should not hesitate to spend the small amount of the registration fee in order to protect and enhance the value of this investment. Many an aspirant to practice law or medicine would gladly pay many times as much to secure his admission to practice; so would many a man who has been rejected for engineering registration.

It is for the profession to estimate how small the registration fee can be made with assurance of adequacy to cover the expenses of administration of the law. In Colorado, where a surplus accumulated, the profession secured the passage of a bill to expend the fund for the establishment of a large engineering reference library. In New York, the state has retained a surplus of nearly $300,000 out of the fees collected, principally in the early years of large volume of applications; such profit was not intended. The aim is to adjust fees to the cost of administration, and to use any surplus for improving the enforcement organization. In time, legislators will be educated to appreciate that at least half of the total cost of registration and enforcement should be contributed by the state, since the law is primarily for the protection of the public.

Reciprocal Registration

Although many of the state laws contain provisions making it permissive to enter into agreements for reciprocal registration, such procedure as between any two states is unworkable unless the two states have identical qualification requirements and standards. As a rule, no state is willing to delegate its qualifying authority to another state. Consequently, formal application for registration has to be made in each state in which the candidate desires to practice. Possession of previous registration in another state is given due weight in considering the application, and may be grounds for waiving examinations and examination fee.

Since engineering practice is frequently interstate in character and many engineers have a nationwide practice, it is important to facilitate interstate registration. For this purpose, the National Council of State Boards of Engineering Examiners (comprising 26 state registration boards) has established a National Bureau of Engineering Registration to serve as a central examining and certifying agency. The National Bureau maintains the qualification requirements specified in the Model Law, which are equal to or higher than the requirements of any state, and its certificate is accepted by the individual state boards as prima facie evidence of qualification without further examination. The National Bureau application fee is $10, and many of the states (as suggested by the Model Law) reduce their registration fee from $25 to $10 when the National Bureau certificate is presented.

The procedure of utilizing a National Bureau of Registration follows successful precedents established by other professions, including Medicine and Architecture. It is a necessary expedient since it is impossible under our constitution to make registration a federal activity.

In addition, most of the state registration laws permit unlicensed practice for 60 days in any calendar year by a non-resident who is registered in his own state, and for a further period if application is filed for registration and until such application is granted or denied.

It is one of the objectives of the National Society of Professional Engineers to extend and improve registration legislation until every state in the Union has a model uniform registration law, with complete reciprocity for interstate practice.

Cooperation of Corporations

The engineer who is registered is more valuable to his employer, and many organizations require that their employees be registered. It is an asset to a firm to be able to announce that all of its employees are registered engineers.

Large railroads, exempt under the registration laws, have directed all of their assistant engineers to secure registration, in anticipation of legal questions of responsibility that might arise. Other corporations have voluntarily instructed their men to secure registration, withdrawing the title of Engineer from those that failed to do so. Some corporations, anxious to have all of their engineer employees registered, are paying the registration fees for their men. Some firms require the engineers in their organizations to be registered in order to be qualified to give expert testimony. Employees making the design or inspection of structures should be registered, otherwise criminal liability is incurred in a failure.

With better understanding, the general attitude of corporations toward engineers' registration has been progressively changed from resistance to cooperation.

Registration and Politics

It is true that registration means the entrance of the profession into legislative activities, but it is certainly high time that the profession make its influence felt in legislative councils.

Once a proper registration law is enacted, no political influence need be feared to pervert the administration of the law. The members of the registration boards are engineers of high standing, nominated by the profession in each state; and, since their service is one of devotion to the profession, self-sacrificing and non-lucrative, there is no inducement to make the appointments a political consideration.

Examinations, registration and revocations are handled by the Board of Examiners, and cases of unlawful practice are decided in the courts.

The administration of the registration law is kept on as high a plane as the standards of the profession.

Registration and Ethics

Registration is the only means by which our profession can enforce its codes of ethics and fair practice. Without registration laws, codes of professional conduct and fair practice are merely documents that may or may not be respected by the individual. But with the backing and sanction of the law we have it in our power in the future to make these standards of ethics enforceable and to stop the practice of those who, by their malpractice, are injuring beyond repair the good name of our profession.

The registration laws generally provide for revocation of license for evidence of incompetence or misconduct in professional practice.

In Ohio, the engineers' code of ethics is printed on the application form and is required to be signed by the candidate before his application for registration is considered. By legal ruling, such advance subscription to the code will facilitate disciplinary action for any subsequent violation. In addition, the county organizations of Professional Engineers have been asked to formulate and adopt local codes of practice and fees for adoption and disciplinary enforcement by the State Boards of Examiners.

The legal profession has recorded in the statutes strict penalties for various unprofessional acts, such as threatening lawsuits in collection letters or soliciting professional engagements. The penalty for dishonorable or unethical conduct is fine, imprisonment or disbarment.

Other professions, in their registration laws, have empowered their state Boards to define unprofessional conduct and the courts have supported such authority.

In Canada, engineers' registration is strongly established and is administered by the Provincial Associations of Professional Engineers; registration and membership are synonymous. In Quebec and other Canadian Provinces, the code of ethics and the code of fees are written into the law by reference, and any violation of these codes is cause for revocation of license to practice.

In the United States, the machinery of disciplinary action under the engineers' registration laws has already been put into effect, and licenses have been revoked on proof of incompetence, misrepresentation, and unprofessional conduct.

Extension of Registration

No state can afford to be without an engineers' registration law. No state can afford to become the dumping ground for the incompetent and the- unscrupulous who are barred from the profession in other states. The individual engineer, if his own state has no registration law, is handicapped in securing reciprocal registration in other states; registered or unregistered engineers from all other states can come into his territory to compete with him, but he cannot practice in their states. Above all, the profession in any state cannot afford to be left out of the progressive advancement and accomplishments of the profession in other states. Registration legislation is the key to such accomplishment for the advancement of the profession.

The enactment of a registration law in any state is generally marked by a new awakening of professional consciousness and unity among the engineers of that state.

Conclusion

Some years ago, the American Society of Mechanical Engineers appointed a "Committee on the Economic Status of the Engineer." That committee, in its final report, concluded that the prime essential for advancing the status of our profession is the establishment of a clearly recognizable line of demarcation to distinguish the engineer from the non-engineer. Registration is the only means of establishing this desired demarcation.

Registration has been used by other professions as a powerful instrumentality for raising educational qualifications, ethical standards, professional status, and public recognition. It will do the same for the engineering profession. It is the only enforceable means of protecting the practice and the designation of the profession against misappropriation and misuse by the unqualified and the unprofessional. Registration is the most effective instrumentality for impressing upon lawmakers, officials, and the public that:

1. Engineering *is* a profession.
2. Engineering is a *learned* profession.
3. Engineering is *one* profession.

SHARE THE WEALTH

(*Continued from page* 10)

rather see the day divided into a less obstinate number of hours than to see people out of work simply because the number of hours happens to be twenty-four. Obviously, however, there are other ways of adjusting conditions to meet the twenty-four hour day.

In conclusion, one is tempted to question the attacks directed against the leading proponents of new movements. Why should the right of any American, to offer a constructive social program be questioned? If there is any hope at all in the future of our not-always too successful democracy, it lies in the safeguard against the abuse of government institutions, including banking, offered by the existence of organizations such as that for Social Justice. Let the leaders of such organizations, as tribunes of the people, declare their opinions to the four corners of the country. Such tribunes with sufficient public backing will accomplish more than written laws in a democracy, where the basic principle must always be the voice of the people. There still exists such a thing as common sense, and it manifests itself by believing an obviously honest man who, though he may make mistakes, has courage enough to say so. To practice and preach humility when such would serve only to encourage an existing social injustice is morally and ethically wrong. It does not help the nation, it might as well be said, it does not help religion. *"Iam proximus ardet Ucalegon."*

PROFESSIONAL ENGINEERING

(*Continued from page* 15)

—and with his engineering mind has saved himself from its furies. That is what an engineer exemplifies; a man who can look at the lightning and think of it in terms of voltage; a man who can hear the thunder and jokingly remark that "lightning is wired for sound!"

What opportunities can be denied to a man of this temperament? And what does it matter to him whether he works for Tom or Dick? Or indeed what his salary check may be? Yes, of course, these things do matter—but only to the extent that they are matters of convenience.

No professional engineer works for others more than a fraction of the time. In fact his work is so always efficient that the community is not yet sufficiently organized for him to work more than a fraction of the time. For the remainder of the said time, he is or should be engaged in showing others how to work, or how to play, or learn, or otherwise occupy their time. The future of professional engineering is quite definite—unless, and until, that particular part of civilization which is predicted upon our national philosophy begins a retrogression which no one can at present foresee. We have not yet started to think about making bonfires of our books, nor of burning up the grass to conserve the soil; nor have we heeded the technocrats but instead have instituted the dole.

Housekeepers are gradually straightening out our books of account. Meanwhile human wants are piling up inexorably. Human wants have indeed been massed into a great pile, which makes the professional engineer rub his hands and keep his slide rule plying unceasingly. He will soon be able to tackle that pile.

PROTEST ON W. P. A. SALARIES

(*Continued from page* 16)

determined at the discretion of the local administrator, (2) supervisory and administrative employees.

While this executive order and schedule covers each of the forty-eight states, such order is interpreted, at least in the State of New Jersey, to mean that no substantial compensation or deviation in the amounts of compensation can be provided for men in responsible charge of work or services other than those who were fortunate enough to be selected for the state headquarters administrative staff. This is a gross and unfair preference to a selected few and a corresponding penalty to the great number of men throughout the state who have similar responsibility and are doing practically identical work. Despite the stern requirements of the Federal Government to prevent exploitation of works projects and to spread the cost as equitably as possible, it is apparent that compensation for technical responsibility, par-

(*Continued on page* 25)

A SCIENTIFIC MONEY SYSTEM

(*Continued from page* 8)

Therefore, every dollar issued in a fixed ratio to population or per capita, is as safe and stable in value and its purchasing power as constant as it can possibly be made.

The only instability of money value would be in the direction of greater purchasing power of the dollar with the growing wealth of the population. Certainly no one could object to that.

In industrial nations like the United States, England, France, or Germany, labor produces proportionately more wealth and proportionately more money is required as a medium of exchange than in prevailingly agricultural nations like Russia, India, Hungary, or the Balkan States. Leaving out for the present the other nations, what should be the amount of money in circulation and in the banks in the United States?

Money Structure in the United States

As a guide to an answer, let us take the money situation in 1922, which is halfway between the normal price-level in 1913/14 and the peak of inflation, which ended with the panic in the fall of 1929. From 1913 when the Federal Reserve Bank Law commenced to operate, to 1922, the price-level had risen 33-1/3% on account of the war. After the temporary depression in 1920/21 it rose another 33-1/3% to the collapse in 1929, that is, the same lot of commodities that cost $300 gold in 1914 would cost $400 gold in 1922 and $500 gold in 1929. Here is clear evidence of the capricious instability of the value of gold as a standard.

The present depression may be said to be caused by the convulsions of business trying to recover from its feverish condition during a false prosperity and to return to the fairly normal conditions before the war in 1913, when the earnings of capital and labor had kept balanced for about 10 years. It can be predicted with tolerable certainty, that the depression will not come to an end until the price and wage levels have returned to the gold purchase value of 1913.

The national wealth in 1922 was estimated at 321,000 Million Dollars for a population of 109 Millions, or nearly $3,000 per capita in gold dollars of depreciated purchasing power in the United States, equal to 2,250 normal gold dollars in 1913.

There were (in 1922) 28,600 banks (federal, state and private) with a combined capital of	4,000	million dollars
and bank deposits (loan funds) of	33,000	" "
currency in circulation	4,400	" "
Total money structure under the gold standard system	41,400	" "
Equal per capita to	$380 in 1922	dollars
or about	285 in 1913	"

Savings Bank deposits intended for investment are not included in the bank deposits.

That the name "Gold Standard Money System" is, as already stated above, a misnomer—that this kind of money has a fictitious character, is shown by the fact that it consists prevailingly of (interest charging) private and bank credit, functioning as money—10 per cent of paper currency, of which there are six different kinds, three of them are not even legal tender—and only a small percentage of gold for redemption of certain bank currency on demand. Small variations in this percentage of gold for our hotch-potch money can cause large variations in the amount of bank credit, which can be manipulated and may vary in the proportion of 10 to 1 with reserve bank notes under present complicated laws. Should the gold decrease or be paid out, the whole system would become shaky and finally collapse. This contingency has happened to some gold-standard countries in the war and can happen in peace times to any country from excessive taxation (it has just happened in the U. S. while this is written, April, 1933) or whose exports fail to pay for its imports.

The vulnerability of these highly artificial gold standard money systems is so sensitive, that comparatively unimportant political events affect their stability. More severe disturbances like war and revolution may wipe them out completely. This is very much less likely to happen to a scientific money system based on the six conditions herein stated and discussed.

Allowing for the need of money for increased taxes, indebtedness, and higher cost of living, *the per capita amount in the United States can be conservatively assumed at* $300 *with a purchasing power of approximately that of the normal dollar in* 1913 *before war-inflation started.*

Working Capital of the Nation

That amount of 41,000 Million Dollars in 1922, represented the working capital of the nation flowing in and out of the 28,000 banks. It represented one-eighth of the national wealth in liquid form, and facilitated with the aid of the check system, the exchange of about 800,000 Million Dollars per year in commercial transactions, producing for the nation a gross income of about 70,000 Million per year, equal to about $640 per capita. (All data are in round figures, but close enough in that year for the purpose of comparison.)

The gross income of the nation rose in 1929 to 85,000 Million, but has decreased to less than 40,000 Million in the present depression and is still sinking.

Taking for a conservative estimate the present population in the United States at 125 Million and the above 300 Dollars per capita as the basis for the present money structure (1933) we obtain on this analysis the total amount of the money structure as 37,500 Million, of which 6,000 Million would be in the form of non-hoardable currency bills and subsidiary coined change money, and the balance of 31,500 Million in credit certificates of large amounts for bank reserves changeable into non-hoardable currency on demand at the Federal Reserve Banks or at the Treasury. They would get into circulation and into the banks gradually as they are issued by the Treasury in payment of its bills and expenses in new money. The old paper money and the checks received by the Treasury for taxes and dues would be destroyed and the new money deposited in their place.

The substitution would be more or less gradual to avoid inconvenience to the public in the transition from the old to the new money. A part of the new money could be paid out by the Treasury for loans to States and Cities at two per cent interest, (including amortization) for the construction of permanently useful and revenue-producing structures, which private capital may not consider profitable enough to undertake. The 2 per cent to be applied to the amortization of the national debt.

It should be kept in mind, that the present credits and deposits in banks, except gold and silver, are not concrete wealth, but merely paper representing wealth. So will the Government credit notes only represent wealth. Both kinds of paper deposits could be destroyed—burned up—and the nation would not be poorer in actual concrete wealth.

Deposits of paper money, paying no interest to the banks or to anybody, will thus constitute the sole money fund against which checks are drawn and from which loans (on collateral security) at the banks may be discounted. But whether the loans are made by the bank (as trustee of the depositors) or by the owners of the deposits, *each loan shall be deducted from the money deposits.* The proceeds of loans shall not be considered nor counted as loanable money of such bank. This will make runs on banks purposeless, since the money is non-hoardable, and its amount in the nation remains constant and so flowing from bank to bank can pay all deposits on proper demand whenever wanted.

Foreign capital and securities may be used as collateral for loans of domestic money, but the total amount of domestic money shall not be allowed to be increased thereby.

This must remain limited as per "Second Condition."

Foreign money of any kind shall not be a legal tender, only the domestic "neo-dollar" shall be a legal tender, as per "Condition Three."

As banks will have no responsibility or expense for redemption of money with gold on demand as now, administration expenses can be low—not over ½%. They will thus be in a position to loan the money to their depositors normally at low rates of interest and still have a fair profit.

The securities of the old deposits would remain what they were, that is, evidences of invested private capital, but they would cease to be a fund of credit, functioning for additional profit as a medium of exchange and charging high interest therefor.

Contracts Payable in Gold

Would not be affected, as already stated, by the change to the proposed money system, except that gold after demonetization would be cheaper in the world market.

The hoarding of gold, so dangerous to

the gold-standard money systems, can have no parallel in the proposed money system, as herein later explained.

No manipulation at the banks could create either artificial scarcity or artificial abundance of money because its total amount in the nation must remain unchanged.

No money can get lost except through actual destruction.

Idle money accumulating in the banks under the proposed money system causes no expense—it is a safeguard and reserve force of tremendous potency in time of slack business, and a preventive against unemployment, because with idle money waiting for investment interest may go below 1% so that labor can be set to work on remunerative work, which at higher rates of interest would not be undertaken.

Restriction of Call Money

The Government should not be a party to workless income.

Loaning of money for stock speculation, so-called "call-money" should be either prohibited or restricted by law, by a tax on the transfer of stocks—say 10% of the market value of the stock *if transferred more than once in thirty days.* This would not interfere with the legitimate trade of selling and buying of stocks, but would effectually curb gambling in stocks, which is conducive to panics and favors fradulent transactions, as has been known for a long time and was shown by the investigations of the U. S. Senate Committee.

It is claimed for the present money system, which in essence is monetized private credit for profit, camouflaged with a modicum of gold, that the easy expansion or contraction of bank credit in a so-called self-liquidating form of short-term notes or acceptances, is in harmony with the variable demands of trade and that this elasticity is one of its principal virtues. But experience has shown, that this is one of its greatest defects, impossible of effective bank regulation.

When business becomes speculative and credit is expanded by means of acceptances (promissory notes, which actually are nothing but debts) based on inflated prices and wages, and discounted at the banks at high rates of interest, it is plain that the banks are thus participating in the dangerous operation of speculative indebtedness, for the sake of bigger profits and in disregard of the patent fact that their action contributes to the debasement of the purchasing power of the gold dollar.

Their judgment is not above that of the unthinking masses, easily mislead by propaganda into the belief that rising prices, wages, rents and cost of land mean prosperity. The banks do not make it their business as they should to check this tendency by refusing credit. When the inevitable reaction comes and inflated values shrink, because the expected profits are not realized and the debts must be paid, only then the banks restrict credits and call their loans, and with such maneuvres bring on a panic.

We know from the devastating experiences of four panics within the last hundred years in the United States, that each panic was preceded by violent speculation, rapid rise of indebtedness, and pseudo-prosperity, and that contraction of credit and money brought on each time suffering and misery lasting many years.

It must be the aim of a scientific money system to prevent such violent inflations and deflations and to maintain the stable purchasing value of the dollar under all circumstances. This can be done by keeping the total amount of money in the nation at a fixed amount per capita, derived from the population of the country and wealth and for normal trade conditions.

The amount of $300 per capita above, deduced as sufficient for normal conditions, or a total of 37,500 Million for the population of 125 Million, will do its work effectively as the automatic regulator and lubricant of trade.

Rising Interest as Brake on Speculation

When business becomes speculative and the demand for money rises, rates of interest will go up through competition, not in arithmetic but in near parabolic proportion, and may reach prohibitory rates up to 100 per cent because the amount of capital (money) is limited. High-priced capital cannot compete with low-priced capital and speculation will come to a stop automatically. If on the other hand, business is light, money will accumulate in the banks. Its quantity cannot be reduced or extinguished as with the present money system by calling loans and contracting credits. The accumulating idle money will seek and compete for investment at low rates, which may go below 2%, and which will induce and stimulate construction and give employment to labor. It can among other things build cheap and comfortable homes for working men at prices and rents which he can afford to pay. They are impossible with 6—10% money, which for a long time have been the current rates of interest in the building industry with the present money system.

The rate of interest is the price paid for money in legitimate productive business, as for the use or loan of a tool. It is a just charge which under normal conditions follows the law of supply and demand.

But this law cannot operate with money based on private credit, the supply of which as at present can be enlarged or contracted arbitrarily by the banks for high profits. This practice spread to such an extent during the last prosperity boom that even the credit and future earnings of poor families were monetized and pledged through installment financing for months and years ahead. Their pledges and evidence of debt had been translated through the manipulation of the banks into mediums of exchange, the total amount of which was estimated to have reached 100,000 Million Dollars, equal to 25 times the total amount of bank capital or 800 dollars per capita.

The result of this multiple inflation of credit was further dilution of the purchasing power of the gold dollar ending in economic disaster. The total indebtedness of the nation, including federal, state, municipal, corporate, private and farm mortgages amounted in 1929 to 203 Billion, or to 1,700 Dollars per capita. On top of this were taxes, and personal indebtedness of which there is no record. The annual interest alone on this mountain of debt is 12,000 Million Dollars or nearly ¼ of the national income.

This appears to the communistic mind as workless income. That doctrine does not admit that capital is entitled to even a modicum of compensation, far less to excessive compensation in the form of usurious rates of interest and in the form of capitalized earnings, and with all that in priority to compensation of labor. But this is the direction in which the abuses of capital have been most flagrant since the war, and there can be no question in any unbiased mind, that the slavery to debt, to interest charging credit which it created, was largely favored by our much-lauded bank and money system baited with a little gold.

This would not be possible with the scientific money system, which will prevent inflation of credit and money, and preserve in the manner stated above the stable purchasing power of the dollar.

(*To be continued in September issue*)

PROTEST ON W. P. A. SALARIES

(*Continued from page* 23)

ticularly in the personnel directing the work generally, has been overlooked.

The New Jersey State Association of Professional Engineers and Land Surveyors and the New Jersey Chapter of the American Institute of Architects, representing the professional men of the State of New Jersey, protest against the obvious unfairness of the schedule and the exemptions determined by the above said executive order. The National Society of Professional Engineers supports this protest most vigorously, as it is clear that the executive order militates directed against the effort continually sought by it to better the condition of the professional and technical men of this country.

It is therefore respectfuly requested that the above executive order be modified to such extent as will permit a reasonable compensation to be paid to the professional and technical men who are in reponsible charge of carrying out the mandates of the President's orders and his program for work relief.

Faithfully yours,
D. B. Steinman
President.

July 31, 1935

Mr. D. B. Steinman, President
National Society of Professional Engrs.,
117 Liberty Street,
New York City.

Dear Mr. Steinman:

Mr. Hopkins has referred to this office your letter of July 27 protesting the application of the security wage to professional and technical men.

We regret that it is not feasible to grant the exemption you request. The Works Progress Administration faces the responsibility of putting 3,500,000 people to work within the funds available. If we were to employ men regardless of their need, we would fall far short of furnishing employment to those who most need it.

As you no doubt know, we are struggling with a national program new and untried. Such a program has to meet innumberable conflicting interests and opinions. We can only say in general that we have taken into consideration all available data in making preliminary decisions. As time and experience show the necessity of making changes they will no doubt be made.

Very truly yours,
(Signed) Nels Anderson
Adviser on Labor Relations.

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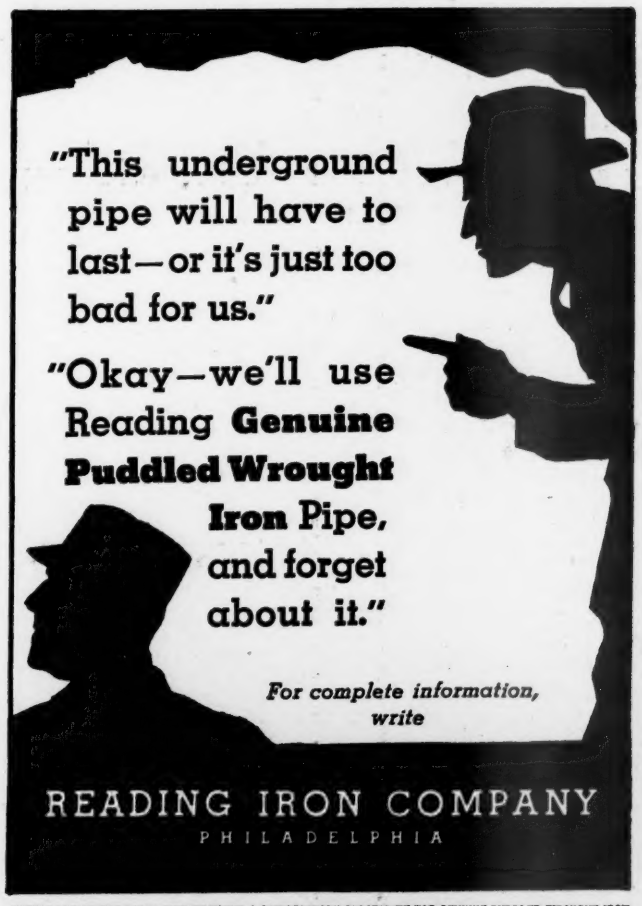
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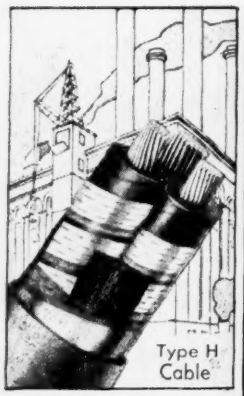
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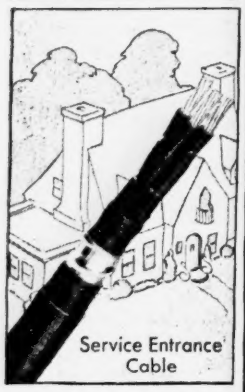
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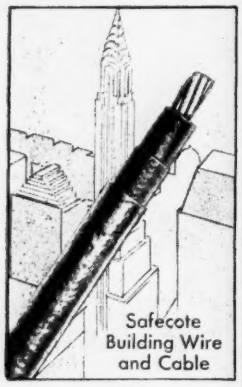
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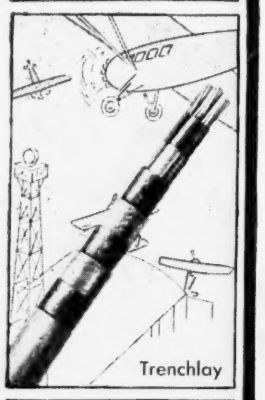
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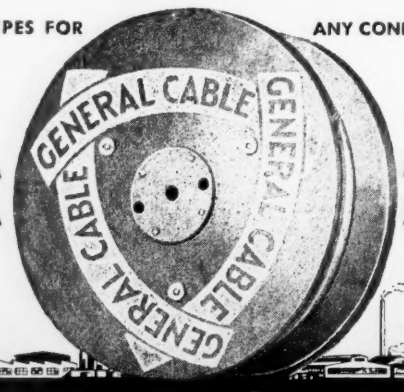

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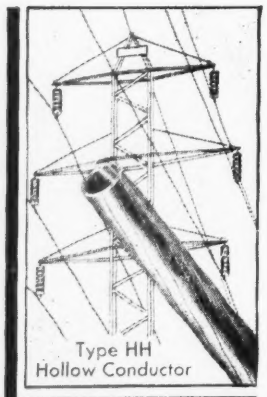
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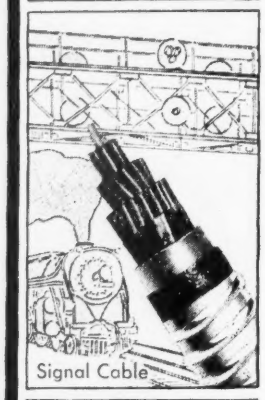
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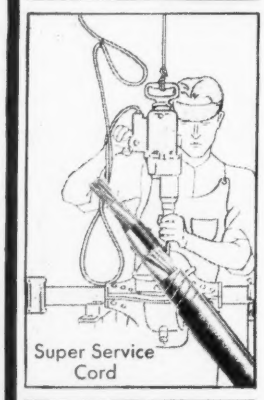
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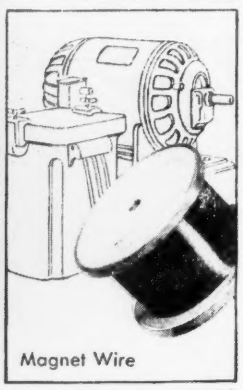
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